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Trends

Crude-Oil Production
By States — Page 60

CRUDE PRODUCTION 4,111,315 bbl. daily average—up 11,620 bbl. One year ago 3,741,570 bbl.

CRUDE STOCKS 239,091,000 bbl. as of July 10—down 1,836,000 bbl. One year ago 251,311,000 bbl.

GASOLINE STOCKS 77,618,000 bbl. as of July 10—down 698,000 bbl. One year ago 84,847,000 bbl.

RESIDUAL FUEL-OIL STOCKS 67,142,000 bbl. as of July 10—up 672,000. One year ago 77,766,000 bbl.

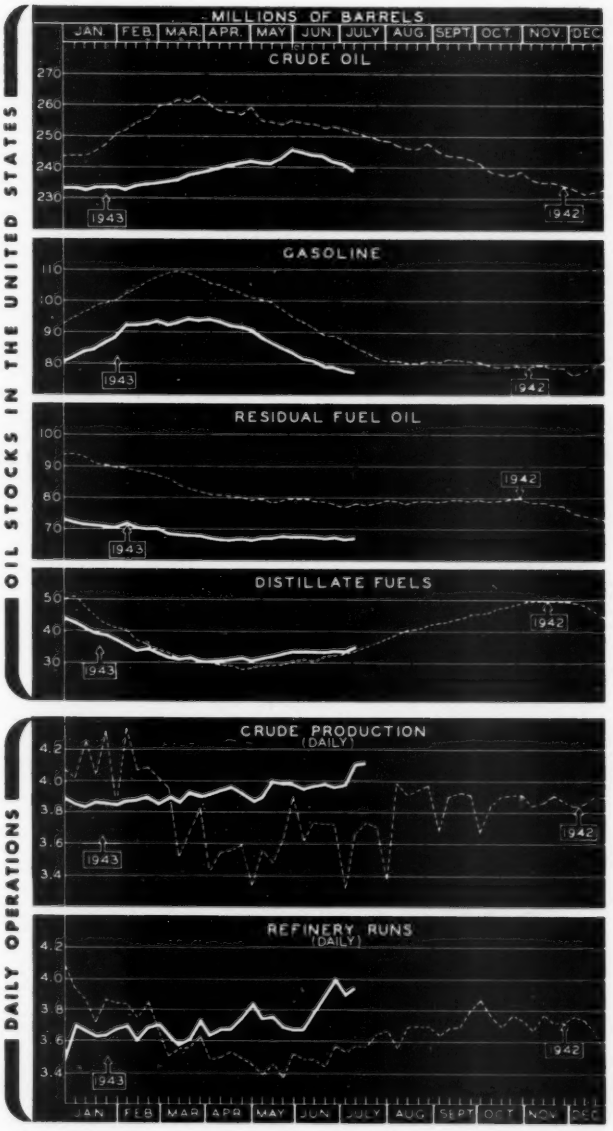
GAS OIL AND DISTILLATES 35,119,000 bbl. as of July 10—up 739,000. One year ago 34,112,000 bbl.

REFINERY RUNS 3,952,000 bbl. daily week ended July 10—up 47,000. One year ago 3,564,000 bbl.

THE definite statement from PAW that within the next 30 to 60 days, as transportation conditions justify, shipments of gasoline to District 1 will be increased and rationing in that district liberalized, has speeded up the discussion of matters having to do with gasoline supplies over the remainder of the year. The new plan assumes that as shipments of gasoline to District 1 are stepped up it will be necessary to reduce the quantity of gasoline consumed within Districts 2 and 3 (Middle West and Southwest) from whose refineries the increased shipments will come. This program has raised the question as to how gasoline rationing should be allocated and enforced in the future. It is known that the Washington agencies concerned have favored a plan in which gasoline would be made available for domestic consumption by states or some other unit of area based on the number of motor vehicles. This would bring a uniformity in gasoline use throughout the country to which many have objected.

AT the PIWC meeting last week there was additional support for the contention that the weakness of the present gasoline program lies in its enforcement. Many executives and Washington officials believe that the desired reduction in domestic gasoline consumption can be obtained and the existing severe rationing in District 1 ended if the abuses in rationing are eliminated. It is pointed out by statisticians in this connection that if the 27,000,000 family cars all had A cards, and allowing them 4 gal. weekly, their requirements would total only 370,000 bbl. daily. This is 18 per cent of the approximate 2,000,000 bbl. daily now being produced in this country for domestic, lend-lease and export shipments.

THE excess use, it is said by investigators, comes from abuse of the B, C, and T cards, especially the C and T cards. The B and C cards were made available to take care of war workers, farmers and others who require supplementary gasoline supplies. The T cards are for commercial users. There is evidence that B, C and T card holders are getting more gasoline than they are entitled to under the rationing plan and if these abuses were ended under an effective enforcement program, domestic gasoline use would be curtailed in line with the program of available supplies for military and civilian use over the remainder of this year without any reductions in the A card allowance.



Thinner Spread of Gasoline Supplies Result of Inadequate Development

by Henry D. Ralph

WASHINGTON, D. C. — The intention to "equalize" the gasoline ration throughout all the states east of the Rocky Mountains within the next 30 to 60 days was announced over the past week end by Petroleum Administrator Harold L. Ickes.

The announcement was approved by the Petroleum Industry War Council, which issued a statement explaining the impending shortage of gasoline in all parts of the country.

How much gasoline the average motorist will get when the equalization is accomplished cannot be predicted now, PAW stated but in all probability it will mean some increase in the East and a decrease in the Middle West and Southwest.

A couple of days before this announcement was made, Price Administrator Prentiss M. Brown stated in an interview in Boston that the ban on pleasure driving in the East probably could be lifted in the near future.

Ickes Explains Factors

In making the announcement, Administrator Ickes said:

"With the completion Monday of the big-inch pipe line from Texas to New York and Philadelphia, railway tank cars can soon be released for assignment to other areas. This offers the transportation flexibility for which we have been working for many months.

"We are recommending that much of this transportation, so made available, be assigned by the Office of Defense Transportation to the moving of additional oil out of the Middle West, thus continuing to take advantage of the shorter haul from that region, as compared with the haul from the Southwest.

"The steadily increasing oil movement out of the Middle West and Southwest is operating to equalize oil inventories as between those sections and the East. As soon as this balance can be established it will be possible to equalize the burden of rationing as between the East Coast and the Middle West and Southwest.

"What the effect of the uniform restrictions upon civilian gasoline consumption will be can then be determined in the light of the full facts as to inventories on hand and new supply currently available. Only on such a basis can policy be determined. It would be faithless to our armed forces to do otherwise, merely as a bow to pressure."

The PAW announcement said that the equalization plan was the result of a carefully considered program which had been worked out with the cooperation of the oil industry and described to members of Congress and to interested government officials, but there was no point in reducing rationing in the Middle West and Southwest before transportation was available to take the excess to the East Coast.

Districts 4 and 5 Exempt

There is not at present any plan to reduce the gasoline ration in Districts 4 and 5 because those areas have relatively large inventories of gasoline and there is no transportation available to transfer stocks to shortage areas.

The PIWC statement, issued by William R. Boyd, Jr., chairman, declared that the ability to equalize the ration, as well as the future value of ration coupons, would depend on military requirements for petroleum products, estimates of which are not known to the oil industry. It pointed out that a shortage of gasoline is impending because of the large amounts of aviation gasoline and other petroleum war products which refiners must produce and also because of the price and other difficulties preventing an increase in crude production.

The council, Mr. Boyd said, agreed that, as soon as the additional transportation permits, gasoline rationing east of the Rocky Mountains be placed on an even basis as far as possible, in effect combining the three petroleum districts affected into a single area for rationing at whatever level is permitted by the supply.

"The entire area will then be able to share the disproportionate military burden which conditions have made it necessary for the East Coast to bear," Mr. Boyd stated. "This is an objective toward which the oil industry and the PAW have been working since long before the war began.

"Unfortunately, however, the virtual solution of our transportation problems coincides with an alarming situation in respect to total gasoline production. The over-all supply of gasoline is now becoming critical. It is obvious that very soon it must be rationed because of a shortage of gasoline rather than a shortage of transportation."

This is a summary of the factors upon which the PIWC based its conclusion last week that greater use should be made of foreign oil resources in meeting inordinately heavy demands for military fuel. Parts of the report contained military data and were not released.

Boyd Criticizes Price Policy

Reasons for the critical oil situation, according to Mr. Boyd, are fourfold:

1. Failure of the Government to meet the continuing unanimous requests of the oil industry and the petroleum administrator for an increase in the price of crude oil.

2. Material and manpower difficulties, particularly affecting the drilling of oil wells.

3. The necessity for manufacturing fuel oil in preference to gasoline, to meet the minimum needs for home owners, war plants, and the oil-fueled merchant marine and Navy.

4. The tremendous military demands for petroleum, which because of censorship have not been revealed to the oil industry, and already, exclusive of huge amounts of aviation gasoline and lubricants, is equivalent to about 25 per cent of the total current production of crude oil in the United States. This demand has an even greater effect because the manufacture of special war products, particularly aviation gasoline, requires a disproportionate amount of the capacity for the manufacture of motor gasoline.

The proposal that gasoline rationing be equalized east of the Rockies was endorsed, as a principle which the oil men believe will soon be possible of physical fulfillment most of

Acme Photo

These easterners jammed a local New York board seeking endorsement of an OPA ruling permitting use of A coupons for one roundtrip to summer homes or vacation spots

the time, provided that there are no further unanticipated military demands upon the East Coast. Equalization in the face of a growing over-all shortage, however, will mean that some measure of gasoline rationing will have to be imposed over the entire area, probably for the duration of the war, even if the rubber problem is solved.

Byrnes Launches Probe of Equities in Distribution of Petroleum Products

WASHINGTON, D. C.—A thorough investigation of the domestic gasoline and fuel-oil situation has been undertaken by the Office of War Mobilization headed by James F. Byrnes, former justice of the Supreme Court.

The investigation was undertaken at the request of Prentiss M. Brown, head of the Office of Price Administration, and of an unofficial committee of East Coast congressmen who met with Mr. Byrnes last week. Mr. Brown has complained publicly that the Petroleum Administration for War has not allocated sufficient gasoline for civilian motorists in the East. Rep. Fred A. Hartley, Jr., of New Jersey, head of the congressional group, has urged further use of various forms of transportation to bring more gasoline to the East Coast from the Southwest and Middle West in order to increase the eastern gasoline ration even at the expense of further curtailment in the supplying areas.

The nature of the OWM investigation was not revealed, but it may have been anticipated by announcement by PAW July 18 that steps were being taken to equalize gasoline supplies in all areas east of the Rocky Mountains. This subject was the chief matter of discussion by the Petroleum Industry War Council which met simultaneously with the Byrnes announcement, and its action, which led to the PAW statement, may have been an attempt to forestall a similar move by OWM.

However, OWM very likely may inquire into other aspects of the petroleum situation which have been the subject of recommendations from the oil industry and various congressional committees, such as the demand for a higher price for crude oil to stimulate exploration and production, and centralization in PAW of greater authority over prices, rationing, materials, manpower control, and other factors affecting the petroleum industry.

Aviation Plant for Mexico Is Approved

NEGOTIATIONS have been completed for construction of a 100-octane refinery in Mexico City. Completion of the agreement between American and Mexican governments was reported this week from reliable sources, although official confirmation has not been announced by officials of the two countries.

Conversations between high representatives of Petroleos Mexicanos, the Mexican petroleum agency, officials of the Petroleum Administration for War, the Department of State and of the Lend-Lease Administration have been under way for several weeks.

Size of the plant agreed upon was not immediately available. In earlier stages of negotiations, however, Petroleos Mexicanos sought priorities on materials for facilities that would cost in the vicinity of $10,000,000.

The Pemex plant will function for duration of the war chiefly as a unit for manufacturing military fuel required in large volumes for maintenance of military and civilian air routes to South America, Africa and the Near East.

Next Week—THE SEMIANNUAL ISSUE

Interpretative reports on all pertinent operations in the petroleum industry under war conditions, including:

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Drilling Contractors Ask Abolishment of Zoning System in Fixing Wage Brackets

by Harry F. Simons

DALLAS, Tex.—Plans to eliminate some of the confusion and problems existing in the drilling contracting industry were made at the meeting of the board of directors of the American Association of Oilwell Drilling Contractors here last week. Also present at the session to aid in developing the best course of action were C. E. Naylor, director of materials, PAW District 3, Houston, Tex., and Allen B. Gibson, representing the director of materials, PAW, Washington.

Manpower and wage brackets have superseded the supply of materials in importance as an operating problem at the present time although the latter is of prime importance now and will probably become more so.

The War Labor Board's division of Region 8 into three zones with each having a different minimum and maximum rate of pay for each job classification on a drilling rig was of particular concern to the drilling contractors and the board was asked in a resolution to rescind its action and eliminate the zones within the region.

Brackets Encourage Migration

The conditions and reasons for not having these zones were set out in the resolution and by contractors in private discussion. The principal one is that instead of helping solve the problem, the establishment of wage zones aggravates it due to the migratory nature of drilling work and workers. If one zone has a higher minimum and maximum on wages, experienced workers will gravitate to these areas to the detriment and possible creation of an acute labor shortage in the others.

Another difficulty comes when a man is transferred from one zone into another, particularly if he is sent into a lower-pay zone. Desirable and necessary transfers of higher-skilled personnel would be impeded by wage zoning, contractors felt.

Another factor would be the confusion in computing pay checks. A contractor operating in all three zones could have three pay rates and in case an employe worked in all three zones during any one period he could be compensated at the three rates. On the other hand, a contractor operating in both a high and a low-pay zone can carry the high rate into the low-rate zone which would give him a preferred position in recruiting men over contractors operating only in the low-pay zone.

Price, equipment supply and manpower have been the stumbling blocks in the oil-industry path and they also affect the drilling-contracting organizations. Last week at Dallas the directors of the American Association of Oilwell Drilling Contractors discussed the equipment and manpower shortages among themselves and with government representatives. The accompanying article is based in part on that meeting.

Underlying the objections is the fact that there never has existed in fact a true wage differential in the several areas in Region 8 as the rates have been more or less uniform with small variations between contracting organizations.

N. H. Wheless, Shreveport, La., president of the American Association of Oilwell Drilling Contractors, spearheads the efforts of contractors to eliminate some of the existing confusion over regulations

For the purpose of fixing wage rates the War Labor Board divided Region 8 into the following zones: (1) East Texas, northern Louisiana and Corpus Christi; (2) North Texas and Central Texas; and (3) southern Louisiana, Houston, Panhandle, Oklahoma and West Texas.

WLB Manning Tables may not be necessary to the drilling contractor although replacement tables will be required, discussion at the session brought out. The Dallas office of WMC had advised that organizations serving less than 200 skilled workmen will not need to file Manning Tables but that drilling contractors should fill out an application to participate in the Manning Table plan (WMC Form 500) and WMC will then advise as to which table the employer should file.

Availability to Be Studied

Proper procedure to follow in handling certificates of availability will be studied in the light of recent WMC rulings by the association attorney and a procedure for drilling contractors only outlined. WMC may also be asked to grant deferment status to rotary floormen the same as other crew members and the U. S. Employment Service asked to grant certificates of availability to trained drilling personnel who are now working in other branches of war activity and who now desire to return to oil-well drilling occupations.

Behind all the discussion on the manpower situation is the condition which has developed within the industry in the last year and a half. From a period of ample trained personnel, the change has come to a potential worker famine.

Drilling contractors have to make out fewer reports than any other branch of the petroleum industry to obtain materials and most of their requirements are MRO items with an AA-1 rating, according to Mr. Naylor, and drilling contractors are therefore a favored class. Even wire line and drill pipe may be obtained as MRO items when used for replacements but otherwise must be obtained on Form PD-873 with purchase order when these are capital items.

(Continued on Page 77)

THIS WEEK

PRODUCTION—Industry's war council calls for greater use of foreign oil, to supply military demand, avoid pulling too heavily on domestic fields. . . . Calls for quarterly report from PAW Foreign Division on availability of oil in foreign producing countries. . . . ¶National production quota in August set at 4,424,600 bbl. daily, an increase of 96,000 over July. . . . Texas assigned 90,000 of increase, Louisiana 25,000. . . . Districts 1 and 2 reduced, continuing reflection of inability to meet previous quotas. . . . ¶Texas widens investigation of producing ability of fields from which heaviest withdrawals are currently made. . . . Railroad Commission members warn that limit is near in certain areas. . . .

TRANSPORTATION—Big-inch line dedicated at formal completion ceremony. . . . Oil for filling line started eastward July 14, progressing at rate of 40 miles daily. . . . ¶Magnolia Pipe Line Co. proposes 12-in. system from West Texas, paralleling existing 8-in. line. . . . New Permian basin outlet would handle 42,000 bbl. daily to Corsicana, Tex., where it could be diverted either north or south. . . . ¶Assignment of tank cars released from service between Norris City, Ill., to East Coast, by completion of big-inch line, to have sharp impact on industry. . . . Details still nebulous BUT some will handle heavier crude shipments from Southwest. . . .

RATIONING—Equalization of motor-fuel distribution to civilians in Districts 1, 2 and 3 approved as policy. . . . PIWC, divided in opinions, endorses the program, apparently by narrow margin. . . . Middle West congressmen prepare to fight movement, contending Washington officials are yielding to political pressure. . . . Lag of 30 to 60 days probable before transportation can be rearranged, accurate determination made of available supplies. . . . Leveling-out program will not apply in Rockies and on Pacific Coast. . . .

PRICES—Refusal of OPA to approve PAW recommendation for 35-cent advance blamed for growing inability to meet production requirements. . . . No break in OPA obstinacy yet apparent. . . . Rep. Wesley Disney of Oklahoma avers price-pressure bloc will be formed in congress, unless relief is forthcoming. . . .

ADMINISTRATION—White House conference with heads of military, economic and petroleum agencies hints at untanglement of conflicts. . . . Brown and Ickes nearer harmony on current rationing-equalization question than on any recent issue. . . . No leak occurs on whether the crude-price question was discussed. . . . ¶Council calls for help in obtaining approval for wage adjustments among administrative employes. . . .

REFINING—Manufacturers continue quiet investigation of available refining facilities, transportation and sources of production, looking to fairly prompt use of more sour crude. . . .

MANPOWER—Drilling contractors complain that labor shortage is more serious problem than lack of equipment. . . . ¶Another 2,000,000 men will be withdrawn from industry before Army realizes full objectives of organization. . . . ¶Regional War Labor Board offices decline to make public wage brackets for oil industry, BUT they are confusing to operators and employes. . . .

This character study of an anonymous refinery worker is symbolic of the manpower problem in the petroleum industry which is growing more acute as Selective Service dips deeper into the available supply. This picture was selected by the Office of War Information as typical of men who produce the fuels for military fighting planes, tanks, ships, mechanized artillery and other instruments of warfare

Council Urges Greater Use of Foreign Oil For Military and Lend-Lease Requirements

WASHINGTON, D. C.—Curtailment of gasoline consumption in Districts 2 and 3, and development of additional sources of petroleum in foreign areas were the principal subjects of discussion here by the Petroleum Industry War Council July 14 and 15.

The result of the discussions on gasoline was evidenced in the related announcements over the past week end by the Petroleum Administration for War and PIWC regarding equalization of gasoline consumption east of the Rocky Mountains. It is understood that marketers in the Southwest and Middle West were reluctant to recommend curtailment of gasoline consumption in those areas but it was finally agreed that Districts 1, 2 and 3 should be treated as a unit in gasoline rationing.

Equalization of motor-fuel rationing to place all states east of the Rocky Mountains on a common basis will have sharp impacts on every phase of petroleum operations. The program will be worked out in 30 to 60 days, or as soon as transportation adjustments can be made.

In discussing foreign-oil sources, several members of the council pointed out that the United States may not be able to supply all the oil requirements of the United Nations, at maximum efficient production rates of known reserves, in view of the increasing military and lend-lease demands. Representatives of independent producers, on the other hand, cautioned against a large program of foreign development and the spread of the idea that we face a crude-oil shortage because of the postwar effects on production and the possibilities of heavy importations of crude after the war.

Broader Planning Sought

At the conclusion of the meeting the council adopted the report of its committee on petroleum economics which stated that while there is no doubt of the ability of this country to supply its own oil needs, the present responsibility for supplying parts of the world formerly supplied by foreign sources calls for plans to relieve this strain on the domestic industry. The committee recommended that PAW be given authority for overall programming of United Nations' oil needs on the same basis that it handles domestic supply and demand.

The economics committee did not present its usual study on supply, demand, and transportation conditions, but devoted its entire report to a discussion of crude production and reserves. Because it contained some figures considered to be military secrets the report was not made public, but the council released 10 conclusions of the committee after the report itself was approved.

The council adopted resolutions asking for more information on the amount of foreign crude available; asking assistance in adjusting wages; and requesting quicker action in obtaining tax-exemption certificates on the sale of petroleum products to government agencies.

The next meeting of the council will be in Washington September 1.

Economic Committee Conclusions

The committee's conclusions, as submitted to the council, were as follows:

"1. Up to date, one of the main problems of the petroleum industry has been a shortage of transportation. The transportation outlook is rapidly improving due to approaching completion of major pipe lines, more efficient use of tank cars, rapid tanker building, and the improvement in the submarine situation. As the result, industry attention must be increasingly directed to the problem of the adequacy of crude supply.

"2. Total demand for crude oil falling upon the United States is approaching 4,200,000 bbl. per day, and is trending sharply upwards, due mainly to increasing military and lend-lease requirements.

"3. Careful studies conducted by the subcommittee on petroleum economics indicate that for 1944 and 1945 the oil fields of the United States should not be counted on to produce without waste more than 4,200,000 to 4,300,000 bbl. of crude oil per day, allowing for the fact that part of our reserves are today inaccessible to the market. Even those quantities are predicated upon the maintenance of steel allocation adequate for existing drilling rates and of existing incentives for field development. These quantities could be raised if incentives and steel allocations were promptly increased. These quantities producible would, of course, be higher now had it not been for the low price ceilings and higher costs of finding oil.

"4. To make possible the maintenance of even the above levels of domestic production as certain areas decline will also require early and continuing construction of additional pipe-line facilities for increasing outlet from the Permian basin (West Texas) and of necessary new refinery facilities to handle additional high-sulfur crudes from this source. This area constitutes the major proven source of additional potential production within the United States.

Unrestrained Production Deplored

"5. While in a real emergency fields could be produced for a short time at higher rates than these, such practices dissipate our reserves and speed the day when even wide-open flow could not meet war needs. Every other reasonable alternative must be explored before resorting to such an unsound practice.

"6. Historically increased crude-oil prices have made available large crude-oil supplies due to stepped-up production and development activities. The incentive of a higher price can be relied upon to bring similar results at this time. Without such price increase the committee feels that the industry may not be able to meet increasing military demand without further curtailment of civilian consumption.

"7. To provide for increasing military requirements, the oil consumption of the domestic economy has, during the past year, been substantially curtailed, and this curtailment is rapidly approaching the level beyond which the efficient functioning of the domestic economy will be impaired. Indeed, in some cases, particularly in District 1, the efficiency of agriculture, industry and public transportation generally has already been somewhat impaired. The existing slack, represented mainly by gasoline consumption arising out of violation of gasoline-rationing regula-

tions, should be eliminated at the earliest possible moment through more vigorous enforcement and better control of coupon issuance and should save enough gasoline to obviate any need for the continuation of the pleasure-driving ban in District 1.

"8. The recently improving trend in world tanker availability and in domestic-transportation facilities makes it possible to utilize a wider range of crude-oil resources than has heretofore been possible, and therefore to arrive at a balanced program based on a more economical and efficient utilization of all world-wide sources of supply.

"9. These facts all point to the vital necessity for an immediate and continuing study of all sources of oil supply available to the United Nations in the various areas of crude-oil production throughout the world, to the end that a balanced world program of supply may be developed, which will not place such a strain on the oil resources of the United States as to impair this nation's ability to maintain adequate future levels of production, or cause unnecessary expenditures of critical materials and transportation. There is no doubt, even today, that American production is fully adequate to meet American needs, but the difficulty is that many parts of the world now being supplied from United States reserves were formerly supplied from other areas under United Nations control, where proven reserves are relatively large, and considerable quantities of crude and refined products could be made available immediately with only a slightly longer tanker haul, and with a minimum of new drilling or refinery construction required.

"10. These results cannot be attained satisfactorily without the institution of a technique for the selection and evaluation of alternatives on a world basis similar to those demonstrated by the committee on petroleum economics and the Petroleum Administration for War, and applied heretofore to the domestic segment of the oil industry. This over-all programming of supply is equally essential to the conduct of the war and to the planning of essential civilian supplies, and to be most effective should, in the opinion of the committee, be lodged in the PAW, the governmental agency which in cooperation with the industry, is responsible for meeting both civilian and military need."

WEP Costs Below Estimates

by Paul Reed

PHOENIXVILLE, Pa. — Disclosure that the War Emergency Pipelines, Inc., 24-in. crude-oil line has been completed at a cost considerably less than the original estimate of $95,000,000 was made at the formal dedication of the system near here July 19.

Discussion among oil company executives and engineers attending the ceremony who have studied the project indicates that the 1,345-mile line may cost as little as $75,000,000. This possible saving is regarded as a tribute to the management of the company directed by B. E. Hull, vice president and general manager, and the pipe-line construction organizations in their patriotic efforts to meet war demands.

The ceremony formalizing completion of the WEP line from Longview, Tex., to the New York and Philadelphia refining areas was simple and brief. One section of 120 ft. was welded into place and the project was declared, for all practical purposes, a completed assignment.

Petroleum Administrator Harold L. Ickes, highest ranking government official attending the ceremonies, dedicated the line to the assurance "that our fighting men and machines go into battle confident that behind them there is no break in the line of petroleum supply, no limit to the volume of oil they need for the bloody job of blasting every enemy into unconditional defeat."

The administrator repeated his frequently expressed warning that completion of the line should not be considered as a signal for increased consumption in the eastern area. He said that full capacity of the line would be required for serving military demand.

W. Alton Jones, president of Cities Service Co., and president of the WEP, complimented Administrator Ickes for his foresight in first advocating the line in 1940 and for his persistence in winning final approval and construction.

C. B. Henderson, chairman of the Reconstruction Finance Corp., which financed the line, represented Secretary of Commerce Jesse H. Jones at the ceremony which was broadcast over a national hookup.

Oil which started moving eastward from Norris City, Ill., in the morning of July 14 is filling the line at the rate of 100,000 bbl. daily, moving eastward at the rate of 40 miles per day. During filling of the line it is expected that the stream will be pumped by stations at Lebanon, Ohio, and Uniontown, Pa. After oil reaches the East Coast it is believed odd-numbered stations will be put in operation to be followed later by even-numbered stations.

The line has been tested with air pressure for practically its entire length.

Within a week the 24-in. line across the Arkansas River near Little Rock, Ark., will be repaired so that oil will be pumped while some additional construction work is being completed to safeguard it against damage by flood in the future.

A throughput of 280,000 bbl. daily is expected in the next few weeks from observation of operation. A reasonably high capacity performance of 315,000 to 325,000 bbl. is expected. Operating experience confirms estimates published in The Oil and Gas Journal's January 7, 1943, issue, "Pipe Line Competes With Tankers," that cost of pumping from Texas to the East Coast will be close to 15 cents per barrel.

In addition to those participating in the line-completion ceremonies the following executives of WEP were observed: Mr. Hull, vice president and general manager; A. N. Horne, vice president and assistant general manager; Oscar R. Burden, general superintendent; Oscar Wolfe, chief engineer; W. G. Heltzel, vice president, Stanolind Pipe Line Co., and F. E. Richardson, manager, Pan American Pipe Line Co., both of whom have served as special assistants to the chief engineer.

Special commendation was given to W. R. Finney, in charge of pipe lines for Standard Oil Co. (New Jersey) for his extensive contribution to achievements of organization and engineering of WEP. For design of pump stations, attention was directed to Lester M. Goldsmith, vice president, Atlantic Pipe Line Co.

Samuel Husbands, president of Defense Plant Corp., which financed the line; J. R. Parten, director of transportation, PAW, and W. C. Kinsolving, director of the pipe-line section for PAW, were present. Contractors' organizations were represented by:

S. Miller Williams, president, and Guy S. Connors, vice president of Williams Brothers Corp.; John Sheehan, treasurer, Sheehan Pipe Line Construction Corp.; T. A. Hester and Paul Halbert of Oklahoma Contracting Co.; S. E. Stanley, president, and C. C. Bledsoe, vice president, Midwestern Engineering & Construction Co.

These directors of WEP were present: Robert H. Colley, president, Atlantic Refining Co.; Ralph W. Gallagher, president, Standard Oil Co. (New Jersey); J. Howard Pew, president, Sun Oil Co., and Robert Wilson, president, Pan American Petroleum & Transport Co.

Texas' Gasoline Consumption Rises More Than 50 Per Cent

by H. Stanley Norman

AN increase of more than 50 per cent in Texas' consumption of gasoline during April was the chief factor in modifying the over-all national decline which was reported as only 14.1 per cent in the monthly statistics issued last week by the American Petroleum Institute. Consumption in Texas during April totaled 200,393,000 gal., a gain of 51.1 per cent compared with the same month a year ago. April consumption in the Lone Star state was 21.4 per cent greater than reported in March.

The rise of 35,435,000 gal. boosted Texas far ahead of other states and registers the first instance in statistical history of the oil industry that first New York and, in more recent years, California have relinquished top consumption position.

National consumption of 1,700,872,000 gal. in April was 14.1 per cent lower than reported by the A.P.I. in the same month last year. Thus, the trend to a more moderate rate of decline in national gasoline consumption was continued. Not since gasoline rationing was applied on a national scale has the rate of depressed consumption recorded such a moderate percentage decline.

District 3's consumption, exclusive of Louisiana on which figures were not available in time for inclusion in last week's report, registered an increase of 27.1 per cent, chiefly on strength of the sharp rise in Texas. New Mexico reported a moderate increase of 1.6 per cent but the three other reporting states in the district, Alabama, Arkansas, and Mississippi, reported declines ranging from 14 to 24.1 per cent.

The Middle West area, District 2, maintained its position as the largest of five consuming regions with an April total of 656,658,000 gal., a decline of 18.5 per cent compared with last April. Two states in District 2, Oklahoma and North Dakota, reported comparatively mild increases of 3.5 and 6.5 per cent, respectively. Michigan with a reduction of 29.6 per cent reflects the most substantial curtailment of consumption among the District 2 states. Tennessee and Wisconsin reported declines of 27.9 and 27.1 per cent, respectively, and Minnesota was 25 per cent below its 1942 rate of demand.

The East Coast district, reflecting the more severe rationing restrictions applicable to those 17 states and the District of Columbia, reported a net decline of 24.8 per cent. The individual declines ranged all the way from 4.6 per cent in Delaware to a maximum of 39 per cent in the District of Columbia and 38.6 per cent in New Hampshire. Comparatively moderate reductions of 8.7 per cent in Maine, 14.5 per cent in Maryland and 17.2 per cent in North Carolina were shown. March consumption in District 1 was 26.9 per cent under 1942 rate.

Declines Progressively Milder

Wyoming with an exportable surplus both of crude and refined products shows the most substantial decline in the Rocky Mountain area, District 4, dropping 21.3 per cent behind the 1942 rate of consumption. Average decline for the four reporting states in the district was 13.7 per cent.

A mild decline of 4.7 per cent is reported for District 5, chiefly the result of only mildly depressed consumption in California where April demand was only 1.8 per cent less than for the same month in 1942. Nevada, the smallest consuming state in District 5, is down 21.4 per cent, but the actual slump in gallons is insignificant.

National consumption of gasoline for the first 4 months of this year declined 19.9 per cent. Aggregate consumption, the A.P.I. reported, was 6,040,788,000 gal., through April compared to 7,543,952,000 for the same 4 months a year ago. Cumulative consumption followed much the same trend as indicated by the April figures although the percentages were generally greater because of the complete prohibition against pleasure driving in the eastern states during part of the earlier months.

CONSUMPTION BY DISTRICTS FOR FIRST 4 MONTHS
(Gallonage in thousands)

	January to April 1943	Per cent decline
District 1	1,871,327	31.2
District 2	2,285,688	21.2
District 3	886,276	*9.0
District 4	99,683	12.8
District 5	897,814	9.9
National total	6,040,788	19.9

*Increase.

There is no readily available explanation of the sharp increase in Texas' consumption of motor fuel. Of course, essential driving in Texas probably is much nearer the preration figure than in many other states because of the inordinate driving distances involved in essential travel. Furthermore, a substantial part of the current consumption can be assigned to the large number of military camps located within the state. Maintenance of services to Texas' large troop concentrations and the motor fuel consumed by military personnel on leaves and furloughs and in training, much of which is reflected in tax collections, are factors which may explain a large part of the increase.

GASOLINE CONSUMPTION BY STATES
A.P.I. Estimates
(Thousands of gallons)

	Apr. 1943	Per cent decline from Apr. 1942
District 1:		
Connecticut	22,045	26.1
Delaware	4,826	4.6
District of Columbia	8,774	39.0
Florida	30,071	24.2
Georgia	25,953	34.1
Maine	9,429	8.7
Maryland	23,135	14.5
Massachusetts	39,783	27.5
New Hampshire	3,847	38.6
New Jersey	53,346	22.7
New York	101,064	26.5
North Carolina	31,947	17.2
Pennsylvania	88,842	26.2
Rhode Island	8,244	20.5
South Carolina	14,876	24.6
Vermont	3,010	29.0
Virginia	29,963	20.8
West Virgina	11,367	23.0
Total District 1	510,522	24.8
District 2:		
Illinois	101,313	21.5
Indiana	58,921	8.7
Iowa	44,338	18.4
Kansas	37,700	5.2
Kentucky	19,278	13.8
Michigan	78,723	29.6
Minnesota	33,493	25.0
Missouri	45,995	20.0
Nebraska	18,133	7.8
North Dakota	14,123	*6.5
Ohio	102,421	16.2
Oklahoma	33,130	*3.5
South Dakota	11,937	6.1
Tennessee	21,815	27.9
Wisconsin	35,338	27.1
Total District 2	656,658	18.5
District 3:		
Alabama	21,536	20.3
Arkansas	13,320	24.1
Mississippi	17,247	14.0
New Mexico	7,642	*1.6
Texas	200,393	*51.1
Total District 3	260,138	*27.1
Idaho	8,133	12.2
Montana	9,954	16.1
Utah	8,351	7.8
Wyoming	4,099	21.3
Total District 4	30,537	13.7
District 5:		
Arizona	9,722	6.4
California	179,415	1.8
Nevada	2,935	21.4
Oregon	19,017	16.8
Washington	31,928	9.5
Total District 5	243,017	4.7
National total	1,700,872	14.1

*Increase.

FOUNDED IN 1910

BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

Effective Public Relations

WE, and we believe millions of other Americans, were impressed with the statement of a rubber manufacturer appearing as paid advertising in scores of newspapers Sunday.

The report of a thousand words, requiring a few minutes' reading time, gave the present and future of synthetic rubber. The explanation, no doubt, was a shock to those who have been misled by Washington releases, abbreviated news and radio reports into believing that synthetically made tires would shortly be rolling off the manufacturing lines in sufficient volume to take care of everybody.

The rubber-company president presented the facts clearly and concisely, the favorable and the unfavorable, and asked cooperation in the conservation of rubber through the critical year ahead.

This was a courageous and patriotic thing to do. The action is a distinct contribution to the war effort. It will aid honest and competent Washington officials. Furthermore, it was a good public relations job for the rubber industry.

We are leading up to a recommendation that the oil business follow suit and for the same reasons. Petroleum consumers have been led to believe many things that are not so.

A brief and comprehensive explanation coming from one company or a group of operators will be accepted over any other source of information. Sincerity and frankness in the discussion of a war problem by those who know more about it than anyone else, is particularly appreciated now in view of the hokum and sidestepping which is too often characteristic of the Washington political controls.

It would not be difficult to explain petroleum's war position. It could start with a paragraph on what operators have been called upon to do since December 7, 1941.

The report should explain that while other major industries largely or completely dropped their peacetime pursuits and concentrated on their part in the emergency, the oil business has added its war contributions to what it was already doing.

The loss of coastwise shipping and the importance of the 24-in pipe line whose completion was celebrated Monday and all the other emergency accomplishments in transportation should be put together in one coherent report.

Without becoming involved in detail the vastness of this integrated industry with its more than 400,000 oil and gas wells, its 450 refineries and 600 natural-gasoline plants, the more than 100,000 miles of pipe lines and tens of thousands of bulk and service stations, could be presented in outline.

The demands for petroleum which touch every American family as an essential commodity should be emphasized. In this connection proven reserve trends as the source of supply need interpretation.

The statement would point out that despite these responsibilities to the military and to civilians, drilling, which is the heart of what the oil industry can do, has been curtailed 50 per cent in order to make more materials available to other industries whose war products are useless without oil.

Price comparisons and needs naturally would be a part of a complete war summary of oil.

The public reaction to a factual presentation would be highly favorable so far as the oil business is concerned. It would get action as to remedies. It would be welcomed by those government officials who are trying to win a war and not elections.

Collier Says Elk Hills Contract Was Inimical to Company Interest

WASHINGTON, D. C. — The Elk Hills contract with the Navy which was cancelled after severe criticism by the Department of Justice was not favorable to Standard Oil Co. of California but was accepted under pressure of the war, H. D. Collier, president of the company, said in a statement released on a visit to Washington.

Production in Elk Hills currently is 15,000 bbl. per day, of which half comes from wells on Standard of California property, as against the company's total production in the state of more than 150,000 bbl. per day. But Standard of California's estimated proved reserves within the reserve constitute 15 to 20 per cent of all its reserves for future production.

"I have been asked by the press," declared Mr. Collier, "as to certain details regarding the Elk Hills contract.

"The press has been particularly interested in knowing why, if the contract was a good one, Standard of California was willing to let it be abrogated.

"The facts of the case are really quite simple. Standard of California owns some 8,300 acres of oil land in the Elk Hills field, where the Navy also owns oil lands. Our company has owned this land for many years, and it represents a considerable value to us.

"During the past few years the Navy has been trying to bring about an arrangement which would consolidate our respective holdings in that field, with a view to conservation of the oil for national needs.

"Standard of California has been entirely in sympathy with the Navy's wishes concerning a unitization plan, disagreeing with the Navy only with respect to apportionment of interests and rate of production. Pending an agreement, our company has respected an expressed desire by the Navy that we refrain from extensive development of our property, since such extensive development would perhaps have the effect of draining oil from the Navy's lands.

"Last year, under the pressures of war, we agreed to a contract for joint operation of the Elk Hills field and for a division of the oil.

"We accepted this contract notwithstanding the fact that we considered it unfavorable to our interests in some important respects. In fact, we considered it a very costly sacrifice on our part, for it not only restrained our use of our own oil lands during the war, but after the war period would, at the Navy's discretion, actually close down our wells indefinitely.

"At the same time the contract would compel us to stand ready at any moment, even though it might be 50 years from now, to reopen the field and produce and handle the oil upon the Navy's order.

"All this was like giving the Navy a blank check on our privately owned resources, and to some extent on the very future of our company.

"But we had little to choose from. In the first place we appreciated the Navy's position as being devoted to the over-all protection of the American peoples' interests, and particularly in time of war. The national interest was a prime consideration, we recognized that fact, and of course we were eager to cooperate with the Navy as we had in the past.

Condemnation Constant Threat

"Secondly, there was always the threat of condemnation hanging over our heads. Condemnation of privately owned lands and government operation of business is of course abhorrent to the principles of free enterprise which have made our American people great, principles that have carried us forward to the highest living standards known in all world history.

"Of course we would be forced to resist condemnation, if it came to that, but would not want to be put in the position of obstructing any important governmental program—certainly not in wartime.

"Therefore the contract seemed the lesser of two evils, and we accepted it, but not without consciousness that it imposed a costly obligation upon us, and to a considerable extent curtailed our position as a free American enterprise.

"Last month the secretary of the Navy advised Standard of California that the attorney general had informed him that the agreement was not authorized by law. Secretary Knox stated that he was bound by the attorney general's opinion, and asked Standard of California to rescind the agreement. Our company indicated its willingness to do so on that ground.

"Unfortunately, the contract has been publicly misrepresented, either deliberately or through an inadequate understanding of its terms. I am quite willing to agree that the contract was not all that could have been desired from our company's point of view, but ironically enough the attack made upon it was based on the premise that it was!

"That fact, I think, will be recognized some day as one of the most peculiar aspects of the situation. In any event, we are now engaging in conversations with the Navy, looking to a new contract that may suit the critics.

"As Americans first and as business men second—but business men who can and who want to contribute materially to our war effort — we of Standard of California naturally hope that differences of opinion regarding scope and details of the contract may soon be reconciled."

Appalachian Restrictions Are Relaxed

WASHINGTON, D. C.—Wells to 1,200 ft. on 5-acre spacing now are permitted in the Appalachian area which has been extended to include certain eastern counties in Ohio and Kentucky. The more liberal spacing provisions authorized in the eastern area are stipulated in Amended Supplementary Order 2 to Petroleum Administrative Order 11.

Four important changes in PAW regulations are contained in the revised supplementary order, which became effective July 15.

1. Allows 5-acre spacing for oil wells to a depth not exceeding 1,200 ft., in lieu of the former provision allowing this spacing to a depth of only 1,000 ft.; 10-acre spacing for oil wells more than 1,200 ft. deep but not exceeding 2,500 ft.; and 20-acre spacing for oil wells exceeding 2,500 ft. in depth continue unchanged.

2. Permits the installation of pumping or other artificial lifting equipment on oil wells drilled to a depth of 2,500 ft. or less, to which at least 5 productive acres can be attributed.

3. Extends the area covered by the supplementary order to that part of Ohio which is included in and which lies east of the counties of Lorain, Ashland, Richland, Knox, Licking, Fairfield, Hocking, Vinton, Jackson, and Lawrence, and to that part of Kentucky which is included in and which lies east of the counties of Lewis, Bath, Menifee, Powell, Estill, Jackson, Laurel, Whitley and Fleming.

4. Deletes the provisions for secondary-recovery operations in certain parts of New York and Pennsylvania, because such operations are now permitted under the provision of Supplementary Order 6 as recently amended.

August Production Quota Up 96,000 Bbl.

WASHINGTON, D. C.—The Petroleum Administration for War certified August crude production at 4,424,600 bbl. daily, an average of 96,000 bbl. over July.

Districts 1 and 2 were reduced and Districts 4 and 5 were slightly increased. Texas was increased 90,000 and Louisiana 25,000 bbl. because of increasing refinery runs there and completion of big-inch.

CERTIFIED PRODUCTION RATES
(Barrels per day)

District and state—	Total petroleum liquids Aug. 1943	July 1943
District 1:		
New York	14,600	15,000
Pennsylvania	46,300	46,800
West Virginia	15,600	16,500
Total	76,500	78,300
District 2:		
Illinois	222,800	233,000
Indiana	14,000	14,500
Kansas	300,000	300,000
Kentucky	25,000	25,000
Michigan	60,100	60,100
Nebraska	2,100	2,200
Ohio	10,000	9,800
Oklahoma	347,000	361,400
Total	981,000	1,006,000
District 3:		
Arkansas	75,500	77,200
Louisiana	356,300	331,300
Mississippi	50,000	50,000
New Mexico	110,000	105,700
Texas	1,817,000	1,727,000
Total	2,408,800	2,291,200
District 4:		
Colorado	7,000	7,000
Montana	23,300	21,800
Wyoming	98,000	97,200
Total	128,300	126,000
District 5:		
California	830,000	827,000
Total United States	4,424,600	4,328,500

Oklahoma City Naval Office Rated Class "B"

OKLAHOMA CITY, Okla.—The Oklahoma City office of Naval Officer Procurement has been designated as a Class "B" office and now processes applications for commissions in the Naval Reserve directly with the Bureau of Personnel in Washington, rather than forwarding all applications through the New Orleans office as was formerly done. This change has been made in order to further expedite the handling of applications.

Sinclair Posts Price in Seven Duval Fields

Sinclair Prairie Oil Marketing Co. has posted a schedule ranging from $1.03 to $1.45 in the Strake, Agua Prieta, Blanchard, Bridwell, Cadena, Fitzsimmons and Tesora fields, all in Duval County.

Federal Order Digest

PAW Regulations

Spacing—PAO 11, SO 2, amended: Permits completion of oil wells to 1,200 ft. on 5 acres in Appalachian area, liberalizes restrictions on installation of pumping equipment and extends area into part of Ohio, effective July 15.

Administration—Announcement requests eastern operators to deal directly with District 1 office in New York because complete organization has been perfected under H. W. Dodge, director in charge.

Personnel—Dustin W. Wilson resigns as technical consultant in Refining Division; Robert R. McLachlen appointed assistant director of the Materials Division.

Administration—Assures fulfillment of industry's requirements for internal-combustion engines, if orders are placed 6 months in advance of necessary delivery date.

OPA Regulations

Fuel Oil—RPS 88, Amendment 116: Abolishes ceiling prices for 20-gravity residual fuel oil and higher at Wyoming plants, sets uniform price at $1.04 per barrel, effective July 20.

Gasoline—RPS 88, Amendment 117: Establishes specific margins of ½ cent below consumer tank-wagon ceilings on tank-wagon deliveries of 10,000 to 60,000 gal. in New Jersey, Pennsylvania, Delaware, Maryland, Virginia and the District of Columbia; ¾ cent in the same area for deliveries of more than 60,000 gal., effective August 1.

Transportation—RSR 11, Amendment 29: Sets specific dollars-and-cents maximum charges for oil transportation by the other than common carriers on Gulf Intracoastal Waterway, in the Gulf of Mexico and the Atlantic Intracoastal Waterway south of Norfolk, Va., and on the Mississippi, effective July 16.

Rubber—MPR 149, Amendment 12: Reduces the maximum prices on neoprene rubber hose and belting based on revised price for neoprene of 27.5 cents per pound, effective July 20.

WPB Orders

Control Valves—LO L-272 and L-203, Interpretation 1: Prohibits departure by manufacturers from simplification specifications, except as required by the Army, Navy and other claimant agencies, issued July 10.

Welding Equipment—GLO L-298: Requires owners of idle resistance welding equipment to register with WPB; prevents acquisition of new equipment until reserve pool is in service, effective July 12.

DEATHS

Francis Marion Kell, who had been active in the oil business in Wichita Falls, Tex., since 1900, died at his home in that city last week. He had been ill for several years. His widow survives.

Victor Howard Borsodi, 57, one of the founders of Humble Oil & Refining Co., died in a San Antonio, Tex., hospital, last week. Mr. Borsodi went to San Antonio from Houston 3 years ago. He was associated in the latter city with Jesse Jones and Sun Oil Co.

John Warren, 72, oil man, civic leader and music critic of Tyler, Tex., died in that city last Friday of a heart attack. He went to Tyler in 1931 as a representative of McColl-Frontenac Oil Co., Montreal, Canada.

E. L. Robinson, 80, an independent oil producer of Oklahoma for 30 years, died of a heart attack at his home in Tulsa last week.

Ralph H. Gill, 45, oil operator of San Angelo, Tex., died last week of a heart attack a few hours after returning from Midland, where he maintained an office. He went to San Angelo from Wichita, Kans., 17 years ago.

Cleaborn T. Gamble, 50, an employe of Pure Oil Co. in Tulsa since 1919, died in a Tulsa hospital after an illness of 3 days. His widow and two sons survive.

E. S. Durward, 57, for 30 years employed by Shell Oil Co., Inc., died in a Houston, Tex., hospital, last week. He had served Shell in California, Venezuela and Egypt, as an engineer.

Charles B. Shaffer, 84, died July 18 at Chicago, after an illness of 3 years. Mr. Shaffer was one of the discoverers of the Cushing pool in 1912. A native of Pennsylvania, he followed oil development westward, and wildcatted in the Mid-Continent. He also formed the Consumers Refining Co. at Cushing, Okla., forerunner of Deep Rock Oil Corp.

Marion T. Glass, 55, head of the land department of Union Producing Co., died last week at his home in Shreveport, La. His widow and three sisters survive.

Columbia Treating Plant Converts Waste Gas to Useful Fuel Product

The Arkansas Fuel Oil Co. gas-treating plant described here has attracted national interest. Facilities now are in operation, removing high sulfur contamination. The story tells how the plant converts sour gas into a commercially useful fuel, thus saving a reserve of 130 billion feet.

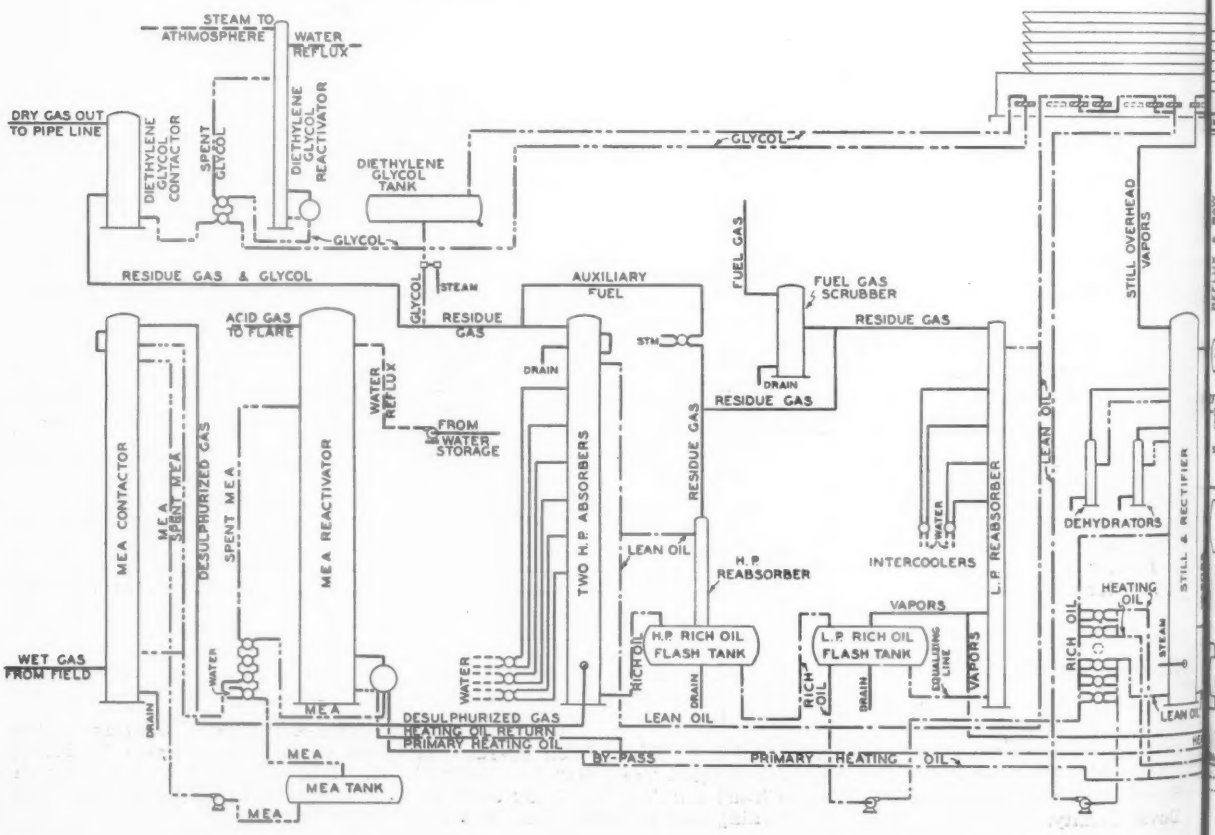
THE problem of utilizing the vast amount of "sour gas" developed in the Dorcheat-Macedonia field since its discovery on August 28, 1939, has been solved and this otherwise useless resource converted into a highly essential commodity by the Columbia gas-treating plant near Magnolia, Ark., which was placed in operation by Arkansas Fuel Oil Co. on May 1, 1943.

Considerable debate and much discussion has taken place since the discovery of the sour-gas field on ways and means of utilizing this vast reservoir. Within the state itself, interest was particularly keen on discovering some method of purifying and converting sour gas into a marketable product. The history of the field has been such that oil and gas authorities estimated an available reserve of more than 130 billion cubic feet of sour gas and some 75 billion cubic feet of sweet gas from the Dorcheat-Macedonia field.

Plans were laid as early as February 1942 and orders placed for equipment for the erection of the gas-purification and hydrocarbon-extraction plant whereby full utilization could be made of the available reservoir of sour gas in addition to the sweet gas being produced in the field. Through the processing and sweetening of this otherwise unfit fuel, the Arkansas Louisiana Gas Co., has made available to the war industries of Arkansas a delivery that will reach 81 million cubic feet daily. In addition a new transportation system, consisting of 139 miles of 12¾ and 18-in. lines, was laid to the war plants and essential industries requiring the fuel. The installation of this system was a difficult engineering problem within itself due to the rough terrain and numerous river and bayou crossings.

At the same time a plant and residential site, some 60 acres in size and located approximately 7 miles southwest of Magnolia, Ark., was secured and actual construction of the plant started May 1, 1942.

In spite of difficulties in securing materials on satisfactory schedules, the plant was completed for full operation on May 1, 1943. However, a



field gathering system, ranging in size from 2 in. to 12 in. and totaling more than 50 miles, was completed in the early part of December 1942, and due to the urgent need of fuel at the vital defense factories, immediate delivery of partially processed sweet gas was started to these war plants. This gas supply to the consumers allowed them to maintain production on schedule and continued until the sweet-gas fuel was supplemented by the purified gas.

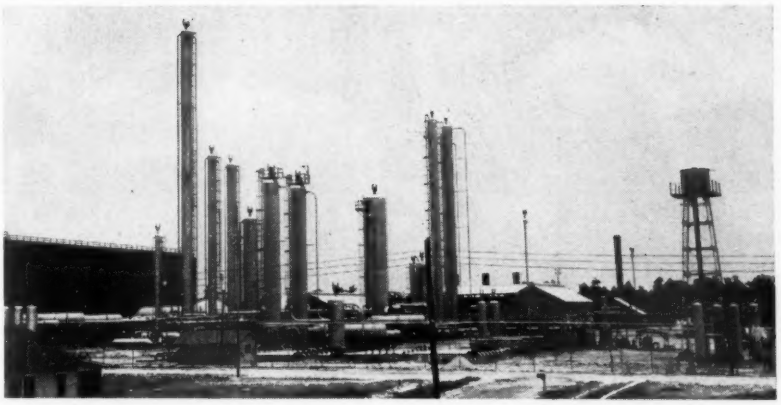
Use of Sulfur Considered

Total production of gasoline and liquid petroleum products at full capacity is approximately 60,000 gal. per day, which is moved by tank car, tank truck, and pipe line. Ways and means of recovering and utilizing the sulfur removed is under study and consideration at the present time.

Actual operation of the plant requires a staff of some 35 men, which includes operators, firemen, oilers, chemists, meter inspectors, loaders, and guards.

Latest and most efficient testing devices are maintained in a modern laboratory which also houses the offices of the plant superintendent and his staff.

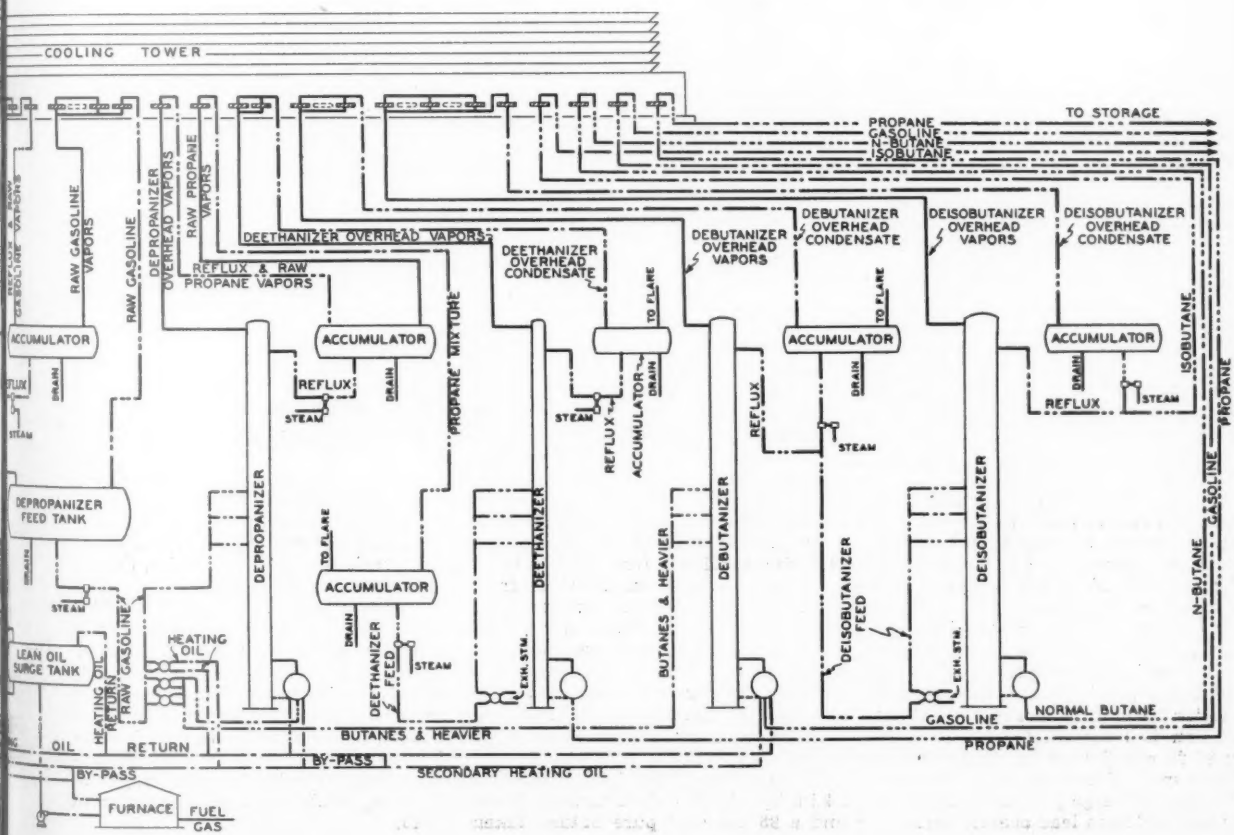
The design and construction of this gas-treating plant was contracted to the Hudson Engineering Corp. of Houston, Tex. The installation of the field gathering lines was contracted to Oldham Brothers Welding & Construction Co., of Greggton, Tex.

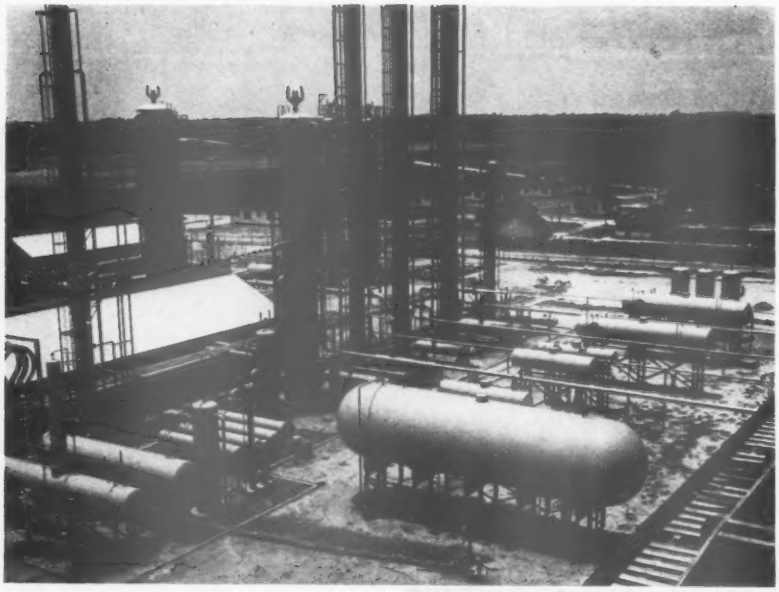


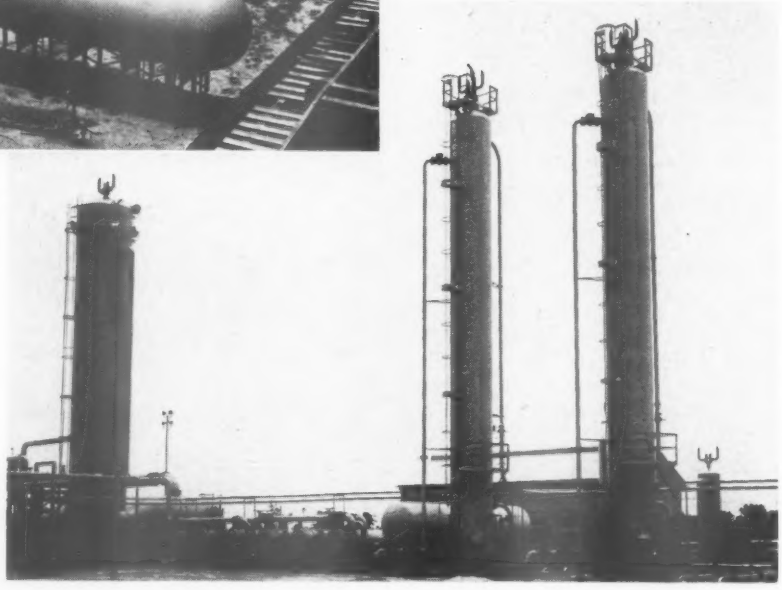
View of purification and fractionation equipment with measuring station in foreground

The Smackover limestone, producing this sour gas, is found at approximately 8,700 ft. Following the completion of the McAlester Fuel Co. 1 Lizzie Franks well in the Macedonia part of the field, the Atlantic Refining Co. completed B-1 Pine Woods in the Cotton Valley sand series of the Dorcheat field which ranges from 7,000 to 8,500 ft., and discovered the first sweet gas. Continued exploration and drilling to the present time has extended the Dorcheat-Macedonia field to about 8 miles in length and up to 2 miles in width throughout Columbia County, Arkansas.

The original reservoir pressure was about 4,130 lb. and is currently approximately 3,500 lb. The majority of the gas-condensate wells in the field have a fluid ratio of about 1 bbl. to 10,000 cu. ft. This production is gathered in lease storage tanks and delivered to field pipe lines. Separator pressures range from 600 to 700 lb. and heaters are installed on the majority of the leases to raise the temperature of the gas during separa-







Above: Overhead view of plant fractionating area with accumulators in foreground and plant-residential section in background. Right: Contactor towers and purification unit

tion and transportation for the prevention of objectional hydrate formations.

In order to understand the complexity of this sour gas, a representative analysis follows:

	Vol. %
Hydrogen sulfide	3.10
Carbon dioxide	2.00
Methane	77.10
Ethane	5.80
Propane	2.76
Isopropane	1.20
Normal butane	1.20
Pentanes	.82
Hexanes	.25
Heptanes and heavier	.07
Nitrogen	5.70

In this analysis, the percentage of hydrogen sulfide represents about 1,972 grains per 100 cu. ft. This sour gas has a recoverable hydrocarbon content of slightly less than 1 gal. per 1,000 cu. ft. The sweet gas produced from the field is quite similar with the absence of the hydrogen sulfide and carbon dioxide.

Complex Sweetening Problem

The problem of carbon dioxide and hydrogen sulfide removal in such high concentrations as was found in the Dorcheat-Macedonia field was complex, but solved by the designing and installation of a Girbotol process purification unit. This process involves the use of two 5½ by 60-ft. towers, packed with tile Raschig rings through which the gas is passed to contact a solution of monoethanolamine. This solution is later reactivated in a 10 by 60-ft. reactivator for recirculation. The combined process is so efficient that the discharge gas passes the U. S. Bureau of Mines lead acetate test.

A recording hydrogen sulfide analyzer is to be installed equipped with automatic alarms for indicating any lowering of the gas purity.

The removal of the condensable hydrocarbons from the gas is produced by equipment of the absorption type, operating at approximately 600-lb. pressure. Two 5 by 114-ft. towers serve as absorbers, from which the rich oil is treated through an Alcorn radiant type direct-fired heater, and charged to a combined still and rectifyer some 6 ft. in diameter and 58 ft. high. The first-step fractionation is a depropanizer, 42 in. by 84 ft. high, and the overhead from this column is charged into a deethanizer from which a 95 per cent pure propane product is obtained. The bottoms from the depropanizer are charged through a debutanizer for the recovery of a 14-lb. vapor-pressure gasoline. A small amount of mercaptans is removed from the gasoline and butanes by use of a Perco-solid reagent treater. The debutanizer overhead is pumped to a 54 in. by 145 ft. deisobutanizer tower and a 95 per cent pure butane taken off the bottom and a 95 per cent isobutane obtained from the overhead.

Propane production is given a caustic wash and dehydrated by means of calcium sulfate in order that it may pass the Cobalt bromide moisture test. The processed gas, before being delivered to the pipe line, is finally treated by a dehydration process for the removal of moisture. This consists of contacting the gas with a solution of monoethanolamine, diethanolamine, triethanolamine, and diethylene glycol.

Completion of the Columbia plant can be credited to prompt action and timely planning on the part of state officials, oil and gas companies, and war industries. From the present reservoir, it can be expected that, following the war, the abundance of this economical fuel will draw other industries to the state, and an objectional, hazardous gas will continue to be converted into one of the state's rich resources.

PAW Assures Delivery Of Oil-Industry Engines

WASHINGTON, D. C.—Delivery of internal-combustion engines needed in all operations of the oil industry is assured, according to a statement last week by Ralph K. Davies, deputy petroleum administrator, who pointed out that applications should be filed and orders placed at once. Engine distributors are requested now to anticipate the needs of their oil-industry clients for different sizes, types and models of engines. Distributors then should apply for the required number of engines by filing PD-1X applications by calendar quarters, commencing with the fourth quarter of 1943.

Calculation of Well-Repair Expense

by E. H. Short, Jr.

In this article the author discusses well-repair expense in terms of "Cost Per Barrel" versus "Cost Per Polished-Rod Horsepower Hour of Operations." Basing conclusions upon operating data, he advances the possibility that cost per polished-rod horsepower hour offers a more equitable method of cost comparison between wells in the same area and wells in widely spaced areas, than the cost per barrel method; and also, provides a more accurate means of identifying high cost well operations.

DURING the past few years engineering departments in a number of oil companies have directed considerable attention to the study of individual items of well operating cost—engine, rig front and pumping unit, sucker rods, tubing and pump.

To facilitate investigations and also to inject an accurate economic picture into well operating studies, cost-accounting systems have been set up in a few companies. From this source engineers responsible for surface and subsurface equipment are furnished the operating cost covering those phases of pumping operation which appear to be too high. In addition to total cost, the information transmitted to the engineers usually is calculated in terms of cost per barrel.

Operating Comparisons—Cost per Barrel

While the expression of expense, in terms of cost per barrel, is obviously correct from a financial accounting viewpoint, it does not appear to be either a very accurate or a practical unit when used in engineering studies of well operations, despite universal usage.

This becomes more evident when it is conceded that managements often single out a low cost-per-barrel operation in one area and call it to the attention of the superintendent in another widely separated area where the cost per barrel on a similar operation is higher.

While such a comparison might bring about some improvement in the operation of the so-called higher cost area, it is more liable to bring forth a spontaneous reaction of defense on the part of those responsible for operations. The management of the so-called higher cost area, from the farm boss to the district engineer and the superintendent, realize that the conditions are not comparable, because the wells in their area differ in a great many ways from the wells in the low-cost area. These differences may exist in respect to one or more well characteristics such as: total production handled, depth, type of horizon and fluid level; and also corrosiveness of well fluid, in the case of subsurface operations. More often than not the entire field personnel spends considerable investigating time, not on how to reduce cost, but why the particular costs in their area should naturally be higher than that of the low-cost area.

Need for "Common Denominator" in Well-Cost Comparison

For whatever satisfaction it might be to the field personnel, who have been confronted with such cost-per-barrel comparisons, the same type of comparisons sometimes originate in the home office of a company, which puts the management in the same relative position of defense often occupied by the field office. On one occasion, the executive department of a major oil company, somewhat perturbed, called on the production department for data and more data after the home office in the east casually inquired why their Oklahoma-Kansas well operating expense per barrel was greater than that of a subsidiary which operated in Texas and Louisiana! As in simple arithmetic, the juggling or comparison of unlike fractions (or wells in this case) can best be done after a common denominator is found. The expression of expense on a cost-per-barrel basis does not appear to constitute a logical authority for comparison between pumping wells in the same area, or between groups of wells in widely separated areas.

Equitable Cost Comparisons

During the past few years there has been a vast amount of engineering work done in respect to well operation, resulting in the accumulation of data pertaining to well weights, polished-rod horsepower and fluid levels. Some companies secure this information at regular intervals on hard pumping wells, and in the comparatively light pumping areas where fluid levels are low, well weights are necessary only at widely spaced intervals of time. These companies maintain records which show for all wells, the normal pumping hours per day, the producing horizon and a rough classification of the fluid corrosiveness. Despite these usable readily available data, repair expense is still expressed in terms of cost per barrel.

Using pump-repair expense as an example, a cost-per-barrel comparison might not afford an engineer in one particular district with a very accurate idea as to where to begin on a program which concentrates upon reduction of pump cost. Obviously, it would be advantageous to select the highest cost wells first, since the possibility for a reduction in expenses should be greater than for low-cost wells. The question then arises as to what constitutes a high-cost well. The fact that one well has a high total pump-repair cost over a given period of time does not necessarily indicate that the cost is excessive when compared with a well having a lower cost. The highest-cost well may be the lowest-cost well when the job of performance is considered, although a comparison in terms of cost per barrel might not be enlightening.

Cost per Polished-Rod Horsepower Hour

As far as the performance of pump, for example, is concerned, there are

four factors which have a direct effect on the operating expense:

1. Pumping depth.
2. Corrosiveness of well fluid.
3. Horizon.
   (a) Sand
   (b) Lime
4. Plunger fit.

It will be noted that pumping depth is listed instead of total depth. This is because of the extremely great variation in fluid levels. However, in cases where the actual pumping depth is known (and well weights are no. available) the polished-rod horsepower may be calculated as follows:

Theoretical PRHP

$$= \frac{\text{Bbl./day} \times \text{wgt./bbl.} \times \text{lift in ft.}}{33{,}000 \times 1{,}440} \times 2$$

The polished-rod horsepower, calculated as shown below from dynamometer charts, should be used when the information is available:

From Dynamometer Card

Maximum load (lb.)	21,000
Minimum load (lb.)	4,500
Dynamometer deflection scale (lb. per sq. in.)	6,400
Diagram area	9.78
Diagram length	3.85

Average effective load:

$$9.78/3.85 \times 6{,}400 = 16{,}250 \text{ lb.}$$

$$\text{Polished-rod horsepower} = \frac{PLN}{12 \times 33{,}000}$$

in which:

P = average effective load
L = length of stroke at dynamometer, in.
N = strokes per minute

Pumping cycle—28—52" s.p.m.

$$\frac{PLN}{12 \times 33{,}000} = \frac{16{,}250 \times 52 \times 28}{12 \times 33{,}000}$$

$$= 59.8 \text{ hp.}$$

In this particular example, the well operated 24 hours a day so that during a 1-month period the total fluid lifted (4,500 bbl.) required 43,056 polished-rod horsepower hours of operation ($20 \times 30 \times 59.8$).

The pump expense during the month was $175 and the cost per polished-rod horsepower hour of operation amounted to $175/43,056 or $0.00406.

Cost per Barrel Versus Cost per Polished-Rod Horsepower Hour

When pump performance, in lifting oil, is considered, there may be a large difference in a comparison between two wells calculated on both cost per polished-rod horsepower hour of operation and cost per barrel. Fig. 1 shows costs for two wells in the same district. On a cost-per-barrel basis, the pump-repair expense for well No. 7 is 40 per cent higher than for No. 3. When a comparison is made on a basis of polished-rod horsepower hour the cost for both wells becomes the same. More efficient pump operation was responsible for the greater production from No. 3 which resulted in a lower cost per barrel. This comparison indicates that neither total pump cost nor cost per barrel would be a correct lead in the selection of wells for investigation which might offer the greatest possibilities for substantial reductions of pump expense.

Fig. 2 is a comparison between 18 high-fluid-level wells approximately 3,200 ft. in depth and 18 low-fluid-level wells approximately 4,200 ft. in depth. It so happened that on a cost-per-barrel basis the pump-repair costs were practically the same for both areas. When calculated on a cost per polished-rod horsepower-hour basis, it was found that operating costs were considerably higher in the 3,200-ft.-high-fluid-level area.

In area A, the fluid level averaged 1,500 ft. so that the pumps were lifting the fluid against a pressure of only 525 lb. per sq. in. In area B, the fluid was lifted from 4,200 ft. so that the pump was operatinging against a pressure of approximately 1,470 lb. per sq. in. All other well characteristics being the same, it should be obvious, by mere inspection of data, that the cost per barrel did not offer a true picture. In this particular study, the cost per polished-rod horsepower in area A was 61 per cent greater than the cost in area B. With these indications as a guide, different types of pumps were installed in area A which brought about a substantial reduction in pump-repair costs.

While pump expense has been used as an example, the polished-rod horsepower hour unit of cost appears to also offer a more accurate method of

(Continued on Page 31)

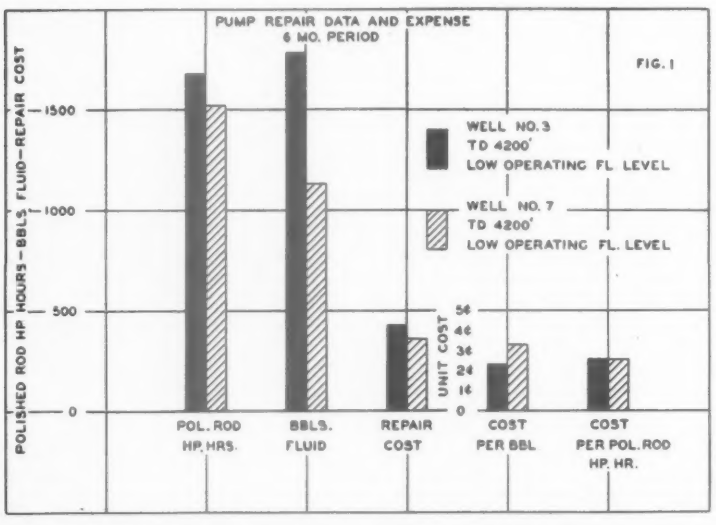


Fig. 1—This chart illustrates the discrepancy which may exist when repair expense is calculated in terms of cost per barrel instead of cost per polished-rod horsepower hour of operation

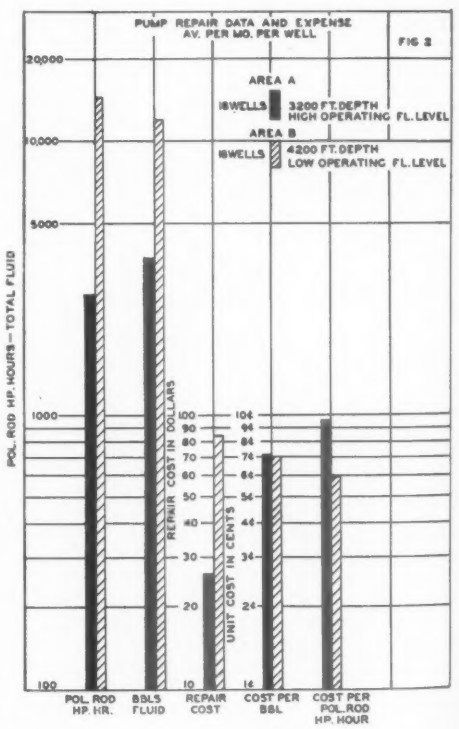
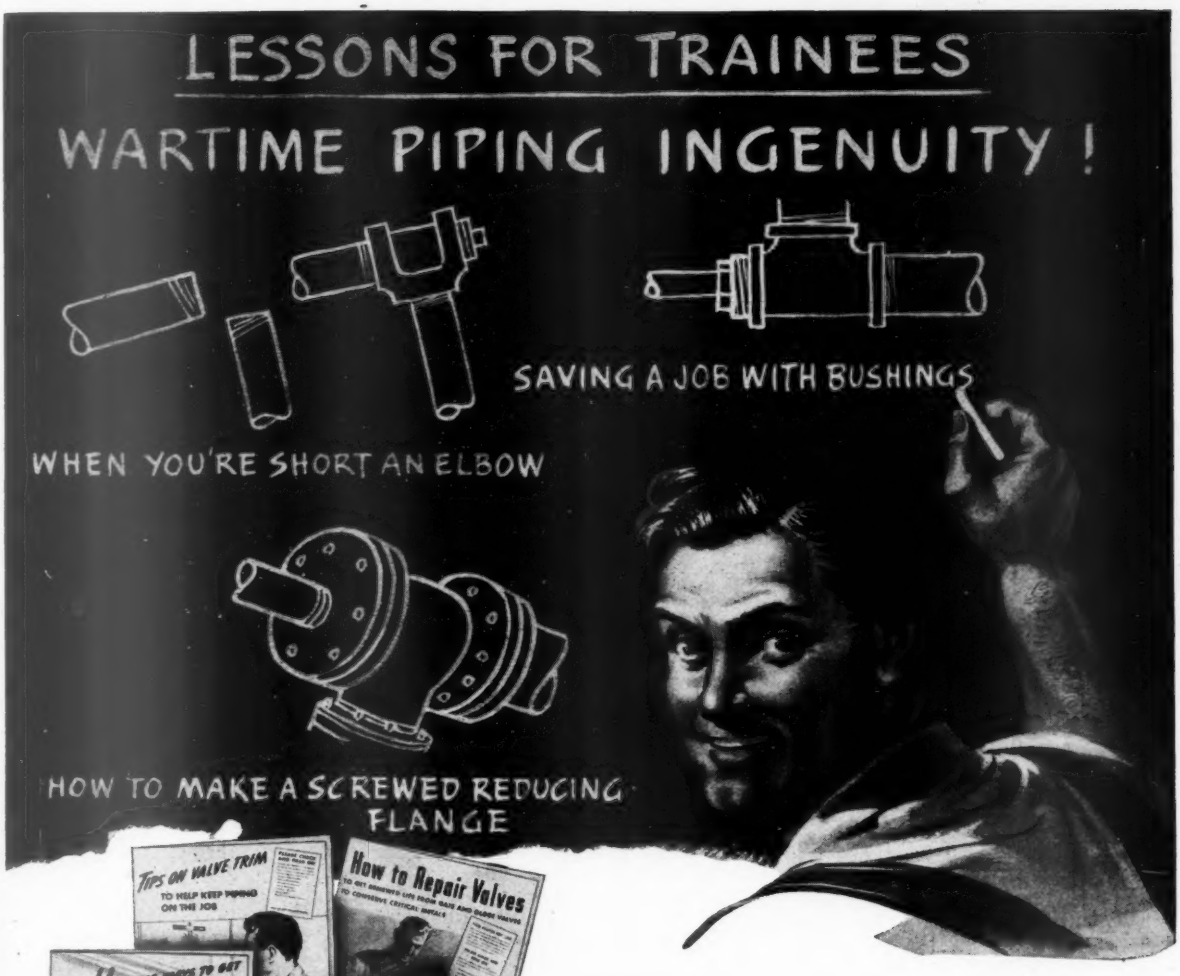


Fig. 2—The 18 wells are representative of the wells in each area. While difference in lift would indicate to an engineer that pump expense in area A was too high, calculations based upon cost per polished-rod horsepower hour offers a reliable lead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ARMY E NAVY

CRANE VALVES

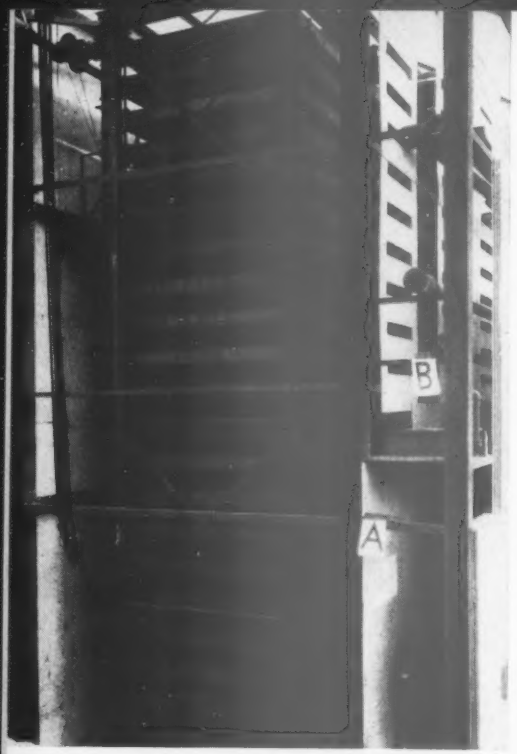


Fig. 1: Pans are arranged in single row instead of double row normally used

New Sweater Improves Yields, Lowers Costs

by I. P. O'Donnell

When Socony-Vacuum installed a new type sweater at its Pratt, N. Y., refinery, a number of improvements were immediately forthcoming, which are described in this article. The new sweater, of a substantially different type from the usual, was designed and constructed by the plant personnel.

THE desirability of controlled temperatures in wax sweating has long been recognized. A variety of methods of attaining this end have been devised and the majority of them have resulted in an improved degree of control that has made comparative uniformity of temperatures possible without entailing disproportionate costs. Among the companies which have devised new methods for sweating with improved results is Socony-Vacuum Oil Co., Inc., which has installed a substantially different type sweater from those commonly used in the industry at its Pratt, Long Island refinery. It was designed and constructed by the plant personnel.

Comparison of the results obtained on the new sweater with those obtained on the old developed the following conclusions:

1. Yields and properties of waxes were improved.
2. A shorter time cycle is effected and this improved cycle can be maintained throughout the year.
3. Lower melting points can be obtained with a consequent decrease in recycling.
4. A saving of 50 per cent or better in utilities costs was effected.

The comparatively simple design of the new sweater is apparent from the cross-sectional diagram shown in Figs. 1 and 5. It will be noted that the pans are arranged in a single row, an arrangement that was dictated by space limitations but which was found to be advantageous since it made it possible to scrub both the surface of the wax and the bottom of the pans with a minimum amount of air circulation. There are four tiers of pans with 21 per tier. The total of 84 pans has an approximate capacity of 40,000 gal.

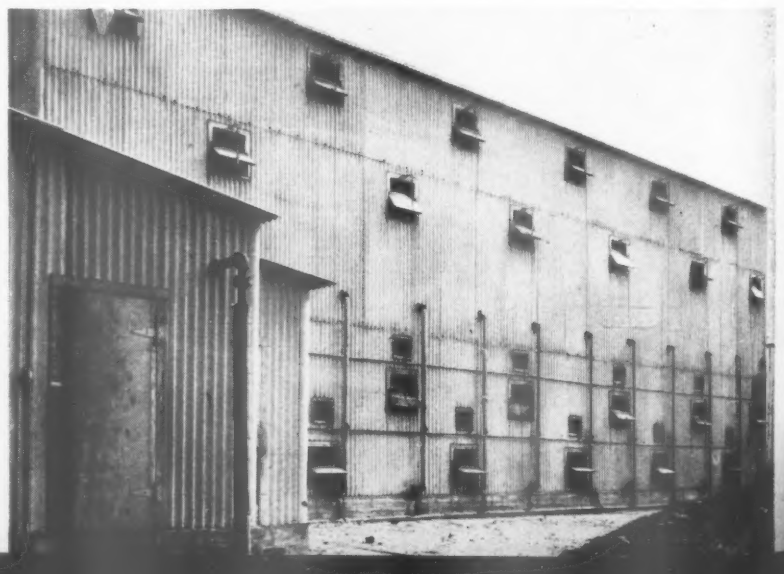
The pans are of a standard design and construction with twenty-eight ¾-standard pipe per coil in each. The screen for supporting the wax is 90-10 per cent commercial bronze wire cloth, 6-mesh, 20-wire 0.035-in. diameter.

The building has a welded structural steel framework. The walls are transite panels which are removable. They are insulated with 0.00045-in. alfol, which is spaced with insulite strips. The sweater is divided into two sections, upper and lower, to enable the circulation of air. Inlet dampers (I) are located in the upper section and the outlet dampers (H) and fans (G), in the lower section. The flow of air is admitted through the heaters (A) and the dampers (E) which are closed during the circulation of cooling air and opening during the recirculation of heated air. The fans and heaters are L.J. wing type 23-15 size No. 26 and are equipped with 1½-hp. motors. They have a capacity of 6,540 cu. ft. per minute. Cooling water and steam used in processing are regulated by a dual time-temperature controller with the cams cut to provide the proper temperature gradient over the complete cycle (Fig. 3).

Operation of Dampers

Operation of the dampers in the course of a complete run follows: After the charge is in the pans and ready for chilling, both the inlet dampers in the upper section and the outlet dampers in the lower section are open while those which divide the sweater into two sections are closed. Thus the air is drawn over and under the pans in the upper section as it is admitted and over and under the pans in the lower section as it is discharged. The distribution of air circulated in the upper section is equalized throughout the tier of pans by means of adjustable louvres, D, as shown in Fig. 5. The dampers are manually regulated. At the same time cooling water, regulated by the time-

Fig. 2: Exterior view showing damper layout



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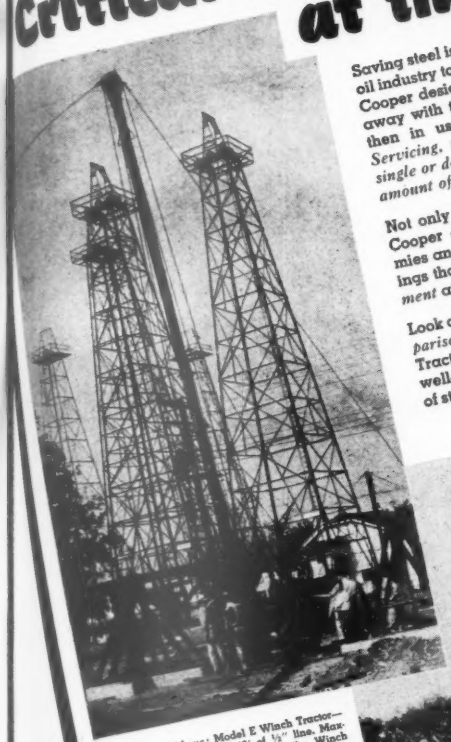
Look at the picture to the left—*and make your own comparison*—between the A-C Model E wheel type Winch Tractor, with single pole telescoping mast, servicing a well—and the five other wells with thousands of pounds of steel tied-up in seldom used derricks.



Above: Model E Winch Tractor—Capacity 9,740' of ⅞" line. Maximum Line Pull 58,970 lbs. Winch drum has *eight* line speeds to 1,074 ft. p.m. at 1200 engine r.p.m. Single pole mast.

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temperature controller, flows through the pan coils.

During the sweating cycle, the exterior or inlet and outlet dampers in the upper and lower sections are closed while the interior, intermediate dampers are open. Steam, also regulated by the time-temperature controller, is admitted to the heater to heat the recirculated air and the water circulating through the pan coils. Thus the same air is recirculated picking up additional heat as it repeatedly passes over the heaters. Dampers remain in the same positions during the melt down with all controls open full to get a quick cycle. This complete cycle is typical for all stocks though sweating varies somewhat due to the characteristics of the charge. Accordingly cams are cut so that the time and temperature controller will be properly regulated.

A comparison of the results obtained on the new sweater with those obtained on the old when running slack wax to crude is given in Table 1. The comparison of results was made on the basis of runs of equal total time for the two sweaters, 30.7 hours. The lower temperatures at which the first cut was taken off and the greater percentage of crude wax obtained in the new unit are the most significant features of this comparison.

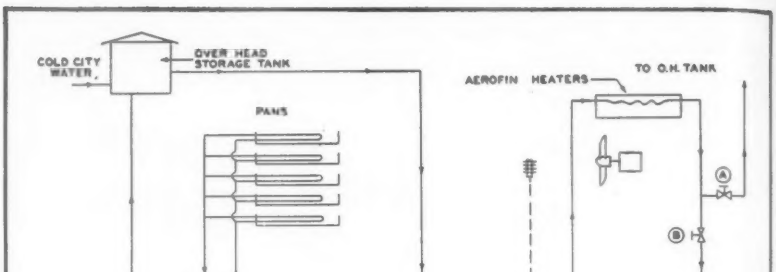


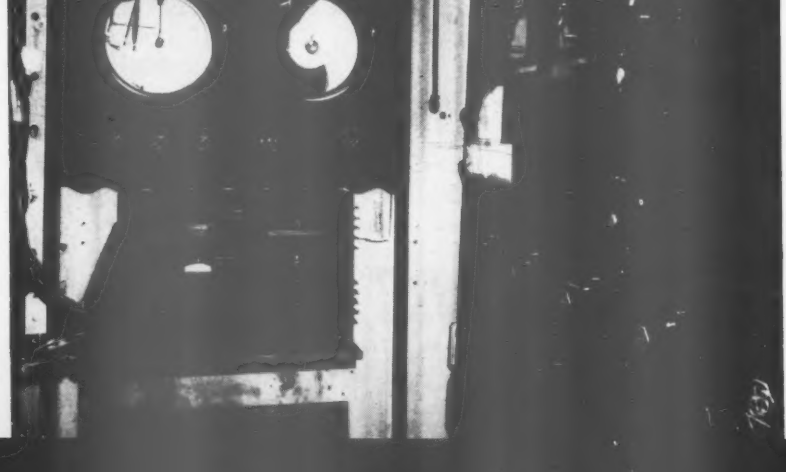
Fig. 4: Diagrammatical sketch of automatic controls

TABLE 1

	Old sweater		New sweater	
M.P. of charge (°F.)	107.75		107.00	
Duration of runs (hrs.)	30.70		30.70	
Time (hrs.):				
To fill water on pans	.53		.70	
To charge wax	1.08		1.50	
To chill	17.50		12.00	
To sweat	10.10		13.50	
To melt	1.41		1.00	
Yields:	°F.	%	°F.	%
First cut	91.00	43.13	89.25	21.66
Second cut	108.25	21.13	105.00	38.06
Third cut	124.75	35.60	124.75	40.20
Loss		.14		.08
		100.00		100.00

Since wax processing, like most other petroleum refining operations, entails a low profit margin, the matter of utilities is a factor of importance. The utilities savings of the new sweater over the old are, therefore,

Fig. 3: Dual time-temperature controller



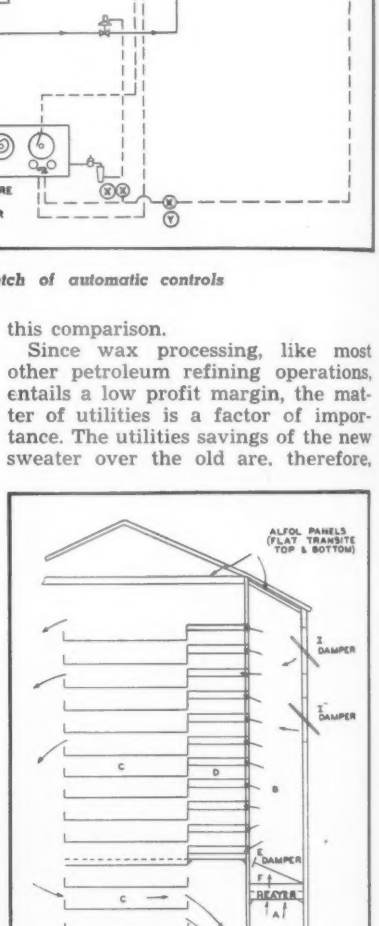


Fig. 5: Cross-sectional diagram showing air flow

TABLE 1

Utility—	Old sweater	New sweater
Total water to chill (gal.)	107,100	84,474
Steam/gal. of charge (lb.)	1.757	.543
Kw.-hr./gal. of charge	.....	.016
Temperature range (H_2O cooling)	84°-87° F.	81°-96° F.
Temperature range (atmos. cooling)	68.5°-77° F.	66°-77° F.

TABLE 3

	Old sweater			New sweater		
	Air in ovens			Air in ovens		
Hour—	High (°F.)	Low (°F.)	Atmosphere (°F.)	High (°F.)	Low (°F.)	Atmosphere (°F.)
First	94	83	71	88	87	77
Second	92	82.5	72	86	84	75
Third	92	83.5	73	84	82.5	74
Fourth	88	80	74	83	80	71
Fifth	88	82	76	81	78	68
Sixth	86.5	84	78	80	77.5	69
Seventh	87	83	76	77	74.5	70
Eighth	87	81	76	76	72	67
Ninth	86	81	77	74	70	68
Tenth	88	82	75	72	70	67
Eleventh	88	81	73.5	72.5	70	66
Twelfth	87.5	80.5	73	72	70	66.5
Thirteenth	87	81.5	72.5	71	68	66
Fourteenth	84	78	72	..	..	..
Fifteenth	78	75	71.5	..	..	..
Sixteenth	83	78.5	69	..	..	..
Seventeenth	81.5	78.5	68.5	..	..	..

significant. Steam consumption was reduced approximately 70 per cent on the basis of volume consumed per gallon of charge and the amount of water required to chill was reduced 20 per cent. The additional factor of electric power is introduced in the new sweater but it proved to be so low that it was more than offset by savings in the consumption of other utilities.

In the comparative runs between the old and new units on the equivalent time basis, results of which were given previously, the steam consumption was 68,598 lb. for the former and 19,445 lb. for the latter. This was a reduction of more than 70 per cent. A comparison of the utilities consumption on the equivalent time runs is shown in Table 2.

The temperature range is included since it illustrates the better efficiency of the new sweater which reduced the temperature of the wax in shorter time than the old unit. Total electric power consumption on this run was 580.5 kw.-hr., a figure which was reduced subsequently more than 40 per cent. This was accomplished as a result of a reduction in the size of the electric circulating pump and in the number of fans used from 12 to 6 since it was found it would not be necessary to use all fans except in abnormally hot weather.

Another factor favorable to the new sweater is the uniformity of temperatures possible throughout the system. Thermocouples were installed at various points and levels in the two sweaters in order to compare their range of temperatures at given intervals. Readings were taken every hour during each part of the cycle. A comparison of those recorded during chilling is given below. While the range on the new sweater varied from a minimum of 1° F. to a maximum of 4° F., the range on the old sweater varied from a minimum of 2.5° F. to a maximum of 11° F. The average differential between the hottest section of the new sweater and its coldest section was 2.54° F. while the average for the old was 6.03° F.

The matter of comparative uniformity of temperatures over the system is important since it means that the wax in all pans is in approximately the same state at the same time. Comparative recordings given in Table 3 were made during the equivalent time runs described previously. Chilling required 17.5 hours in the old unit with 1 in. less in depth of pans against 12 hours in the new unit. The differentials noted during the chilling cycle were comparable to those recorded during the sweating cycle and therefore the latter are not included.

TABLE 4

	Old sweater (°F.)	New sweater (°F.)
Start of stream	114.5	107.5
Composite sample of:		
First cut	116.25	107.5
Second cut	121.25	113.0
Third cut	124.75	120.25
Fourth cut	.....	124.75

The ability to obtain lower melting-point cuts reduces the need for recycling as the volume of low melting-point material is increased. The fact that lower melting-point cuts are obtainable on the new sweater is shown in the comparison (Table 4) in which each unit charged material of 122.75° melting point. Not only were lower melting-point cuts possible on the new sweater but the cuts were also more numerous and closer sweating was obtained.

Possibly the most significant comparison of all between the old and new units is the yield of finished product. In typical runs, charging the same type of stock, finished wax from the new sweater was equivalent to 28.4 per cent of the charge against 25.61 for the old unit. Thus the increase in yield for the former, on a volume basis, was almost 11 per cent. Comparative data obtained on typical runs are shown in Table 5.

An incidental feature of the new sweater is the fact that an operator may open it at any time during the cycle for inspection purposes.

TABLE 5

	Old sweater		New sweater	
	Melting point (°F.)	Yield, per cent	Melting point (°F.)	Yield, per cent
First cut	111.50 to 118.25	43.38	106.75 to 107.50	3.71
Second cut	118.25 to 122.00	10.41	107.50 to 118.25	33.65
Third cut	122.00 to 127.00	20.34	118.25 to 122.00	13.16
Fourth cut	....	.....	122.00 to 127.00	21.06
Finished	....	25.61	....	28.40
Loss	....	.26	....	.22
Total		100.00		100.00

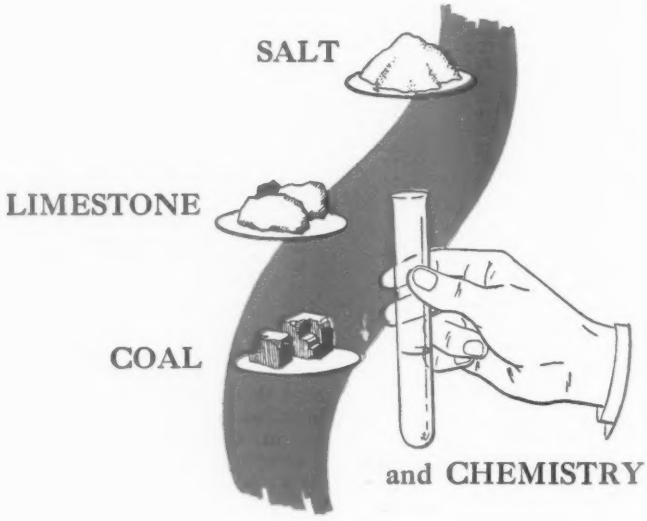
Calculation of Well-Repair Expense

(Continued from Page 26)

evaluating well repair expense than cost per barrel, when applied to the operation of tubing, sucker rods, pumping unit and engine. In the case of engine operation the loss through the transmission equipment must be added to the polished-rod horsepower.

In subsurface-equipment operation the accuracy of the polished-rod horsepower method is dependent upon the application, and a comparison can be only approximate unless the characteristics of the well are the same. Obviously there is a need for an equation which considers both polished-rod horsepower and corrosion. However, at the present time the technique in determining the relative corrosiveness of well fluid is unsatisfactory and the usual sulfide classifications are shown simply as light, medium and heavy. Where comparisons in pump expense are to be made on a polished-rod horsepower hour basis, until sufficient data are assembled to arrive at an empirical figure or factor to be used in the polished-rod horsepower equation which will give due consideration to the additional pump wear encountered in wells pumping from a sand horizon, such comparisons must be confined to wells in the same producing classification, i.e. sand or lime.

FOR VICTORY BUY MORE WAR BONDS



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Taken by themselves, salt, limestone and coal may not have the drama of guns, tanks and planes. But put them together, fused and processed by chemistry, and you have soda ash, caustic soda, calcium chloride, sodium bicarbonate and others . . . all in demand for production of the implements and munitions of war. Pass electricity through salt brine—and you have chlorine and caustic soda.

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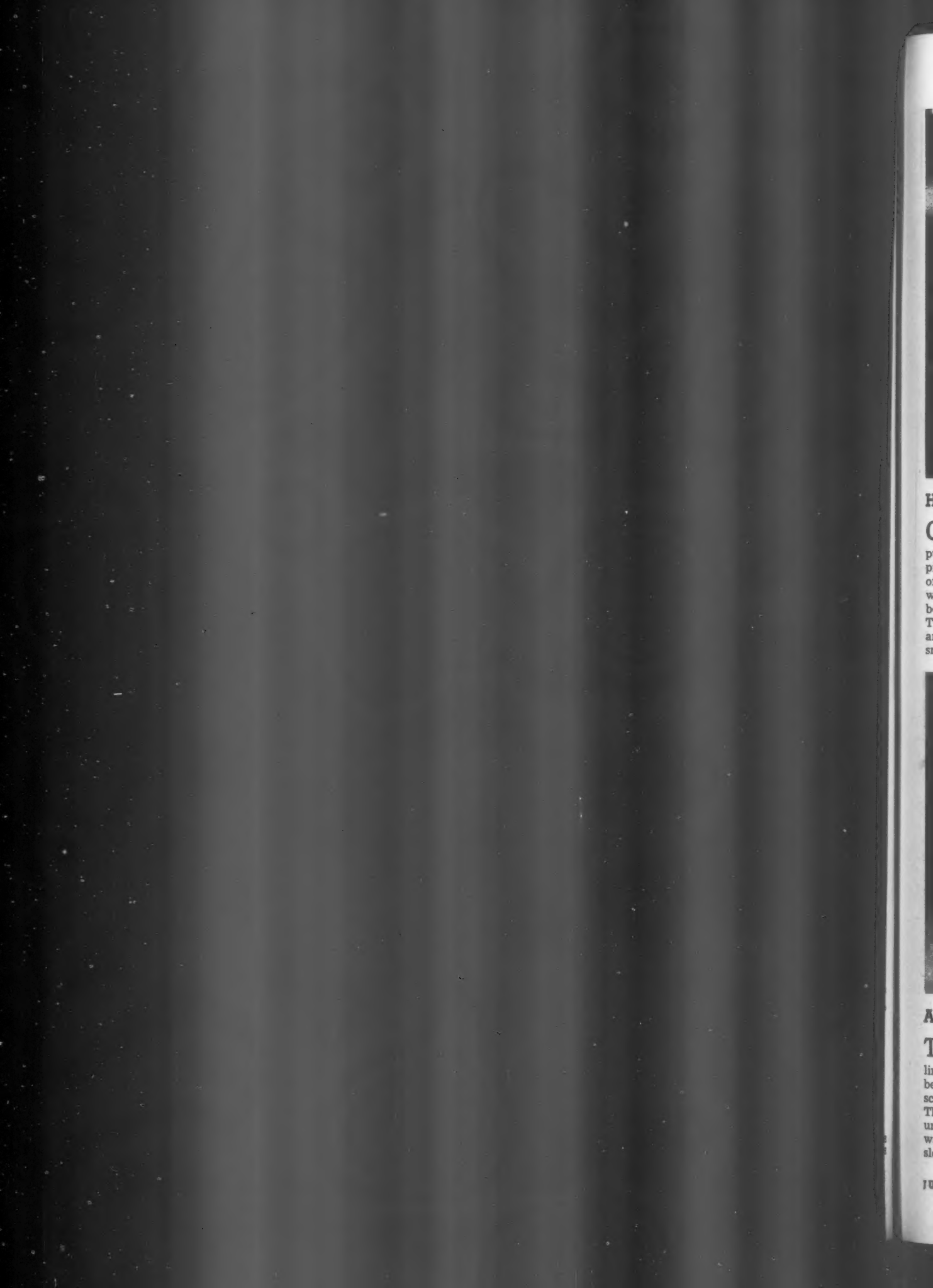
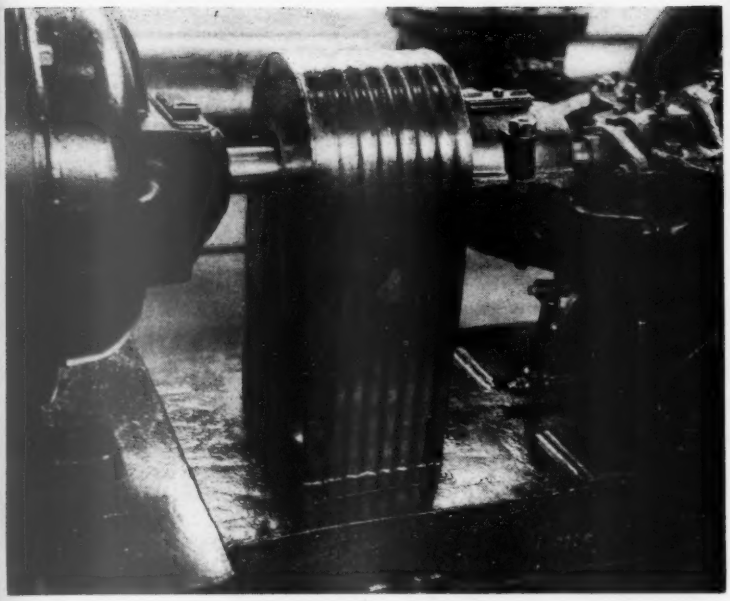
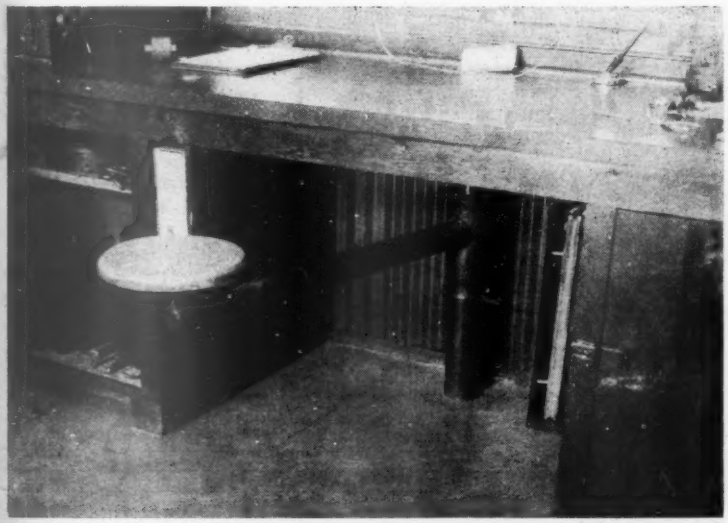


PLANT PRACTICES



Housing for Centrifugal-Pump Coupling

ON an outdoor motor-driven centrifugal-pump installation, the plant operator needed a housing to protect the flexible coupling in the pump and motor shafts. An adequate one, shown in the accompanying picture, was fabricated easily from material on hand. The top consists of a piece of corrugated iron which was cut to the necessary length and width and shaped in an arch to fit over the top of the coupling with the bottom edges resting on the pump base, to which the housing is bolted. The ends are enclosed with thin metal sheets cut to the shape of the arched top and welded in place. Grooves were cut in these to fit down snugly over the shafts.

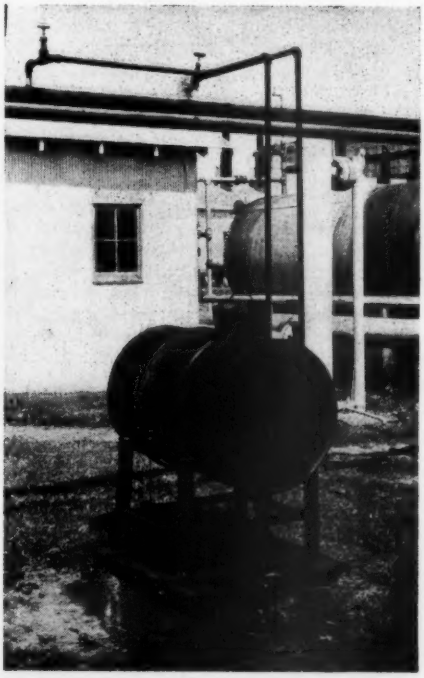


Adjustable, Swinging Stool for Operator's Bench

THE accompanying picture shows a permanently mounted, swinging stool that was devised for a plant operator's bench in a Kansas gasoline plant. The stool is adjustable for distance from the bench and can be pushed back under the bench out of the way by means of the telescoping arm, consisting of a 2-in. pipe which slides inside a 2½-in. pipe. The seat revolves on a removable pivot at the outer end of the arm. The unit swings on a 4-in. upright post set in the concrete floor at the back wall under the bench, the seat arm being mounted in the side of a short sleeve fitting over the outside of the post.

Heater for Reclaiming Oil

LUBRICATING oil that leaks through the stuffing boxes and packing glands of gas compressor and engine cylinders usually contains a quantity of condensate picked up from the gas in the cylinders. Moisture also is contained in the oil drippings from the shafts and bearings. Frequently, this oil is discarded, and for a number of units over a period of time, the amount of oil is sizable and represents an appreciable item of waste. In the accompanying picture is a small heater provided at one plant to serve as a still to evaporate the condensate and water from the oil so that this oil can be reclaimed and reused. An old oil drum is used as the container for the oil being heated. This is mounted horizontally on a leg support at a location in the plant yard convenient to steam lines serving the plant. The waste oil placed in the drum is heated by means of a 1-in. steam coil in the bottom of the drum. The coil in this case consists of a single bend with the line entering one end, extending the length of the drum, and leaving the same end. Steam for heating is taken from a connection to the overhead live steam line and is returned to a paralleling steam condensate-recovery line.



Oil-Well Pumping Practices—No. 4

Sucker-Rod Load Measurement

by J. Zaba

This is the second and concluding part of a discussion of the sucker-rod pumping system. Beginning next week, this series of articles covering all phases of present-day pumping will discuss sucker rods, their properties and behavior in pumping operations. The first articles in the series, which began in the issue of July 1, dealt with the behavior of oil reservoirs.

Polished-Rod Dynamometer

PRESENT-DAY knowledge of the behavior of the sucker-rod pumping mechanism is based largely on the results of direct measurements of the size and range of loads imposed as a result of the pumping cycle. Of the instruments used for these direct measurements, the polished-rod dynamometer is the one most widely used.

The polished-rod dynamometer is an instrument which measures the loads in the polished rod in relation to the position of the rod within the pumping cycle. The measurements are recorded in graphic form in the so-called "dynamometer card."

The reason for the widespread use of the dynamometer is the fact that the instrument can be easily installed and can be used without interferring to any large extent with producing operations of the well being tested. It gives a direct record of loads, from which valuable data in regard to performance and efficiency of the surface equipment can be read or calculated. In addition, because of their peculiar effects on the loading of the polished rod, certain conditions of subsurface equipment can be inferred from the shape of the dynamometer card.

Three main types of dynamometers are in general use: (1) The hydraulic type, (2) the mechanical type and (3) the electrical type.

Types

The hydraulic-type dynamometer[1] consists of the pressure-transforming unit and the recording unit. The pressure-transformer unit is installed on the polished rod and converts a portion of the polished-rod load into pressure, which is transmitted hydraulically through a diaphragm and fluid-filled flexible hose to the recording unit. The recording unit is similar to a steam-engine indicator and gives cards similar to those given by that instrument. The stylus is actuated by the fluid pressure transmitted from the pressure unit and the indicator drum is operated by a wire attached to the walking beam determining the position in relation to the pumping cycle.

The mechanical-type dynamometer depends on the strain gage, attached to the polished rod for recording load changes occurring in the rod.[2] The movements of the indicating parts of the gage, attached to the polished rod, are mechanically enlarged for recording purposes.

The electrical-type dynamometer consists of a magnetic strain gage and a recorder.[3] The strain gage, placed between hanger bar and polished-rod clamp, consists of compression tube, armature and pole pieces, with an air gap between the armature and pole pieces. As the tube compresses under the influence of load, it changes the air gap, unbalancing an electric Wheatstone bridge circuit. Deflection of a galvanometer, recording the unbalanced circuit, is recorded on a photographic film by a beam of light. Calibration is such that the unbalanced current is proportional to load and the record is given in pounds. The stroke component of the load-displacement diagram is taken directly from the beam hanger by means of a cord and a reducing mechanism.

Dynamometer Card

A dynamometer card gives a record of loads occurring in the polished rod, which is a resultant of loads imposed on the rods. As outlined in the preceding installment of this series, these loads consist of deadweight, friction, dynamic and shock loads together with loads resulting from the natural vibration of the rods. With so many variable factors capable of affecting the shape of a dynamometer card its correct and full interpretation is quite difficult. While certain facts can be read directly or quite easily calculated from a dynamometer card, considerable experience is needed to be able to utilize the card fully and to be able to recognize all the information, which its shape conveys.

The load diagram of a dynamometer card is recorded with length of stroke for abscissa and load in pounds, for ordinates.

An ideal dynamometer card, seldom encountered in actual practice, is shown in Fig. 1. Such a card could be obtained in case of a very slow pumping speed, with 100 per cent volumetric efficiency of the pump, and with all the parts of the pumping installation working properly. With Point A (Fig. 1) the beginning of the upstroke of the polished rod the maximum polished-rod load is not reached until at the Point B, this gradual increase in load being the result of the stretch of sucker rods, with fluid load transferred on the rods. In such an ideal case the maximum polished-rod load would be constant through the remainder of the upstroke and would equal the weight of rods, less effect of buoyancy plus differential fluid load on plunger and plus friction. From the Point C of the load diagram, the beginning of

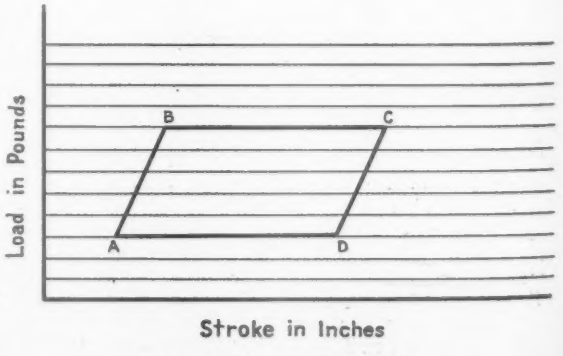


Fig. 1—Ideal dynamometer card

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The progress of the American Oil Industry to the point of producing over sixty per cent of the oil of the world is attributable to the competitive spirit of this most individualistic of industries. We of Mission are planning still greater improvements in Mission products for post-war use by this swift advancing oil industry. Now war comes first.

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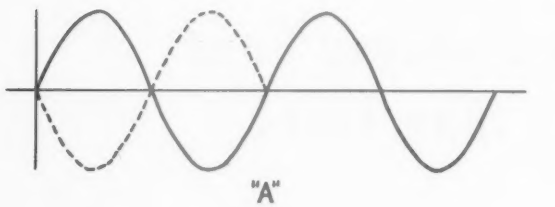
the downstroke, the drop from the maximum to the minimum polished-rod load at D would be again gradual. This would be due to contraction of rods with fluid load being transferred to tubing. From D to A, that is through the remainder of the downstroke, the minimum polished-rod load would be, in such an ideal case, also constant and would equal the deadweight of sucker rods less effect of buoyancy and friction.

In actual practice, loads other than deadweight and friction loads distort this diagram. Certain general norms, however, can be recognized for certain sets of pumping conditions. Deviation from these norms has to be traced to the effect of well and equipment characteristics.

The effect on the shape of dynamometer cards of the natural mechanical vibration of the rods has been analyzed and presented by J. C. Slonneger.[4] In this analysis he arrives at cards for vibrations of different orders by starting with a simple train of vibrations, changing it to a continuous curve within a cycle, correcting for nonuniform motion of the rods and superimposing a parallelogram of forces needed for lifting the fluid. The result is theoretical card for a condition of synchronous vibration. Other factors would, in actual practice, distort further such a card but the general contour remains recognizable.

Fig. 2, reproduced from the analysis quoted above, shows the manner of constructing a theoretical card for a vibration of the second order. Fig. 2A shows in solid line a simple train of two waves. If one of these waves was folded back, as shown by dotted line, the two waves would make a continuous curve. In Fig. 2B this curve is shown corrected in such a manner as to take care of the fact that the displacement is larger in the middle of the stroke than at the ends of the stroke. In Fig. 2C the parallelogram of forces needed to lift the fluid is shown by dotted line. Adding of forces due to vibration and those needed to lift the fluid results in the card shown in Fig. 2C in solid line. This is the theoretical card of second order. Other factors distort the contour of such a card. Figs. 2D and 2E show an actual card of the second order. The characteristic of such a card is concentration of the area of the card at the beginning of the stroke and the loop at the end of the upstroke.

The discussion of the dynamometer cards is presented at this point in the series solely for the purpose of arriving at general understanding of methods used for measuring of polished-rod loads. This understanding will be needed later in the series when in detailed discussion of the pumping mechanisms specific types of dynamometer cards will be introduced. This will be done to illustrate the effect of behavior of different component parts on the shape of the dynamometer card. Use of cards in connection with calculations of power requirements and counterbalancing will be treated in chapters dealing with this problem. Because of this fact no discussion of different types of dynamometer cards is presented at this time.



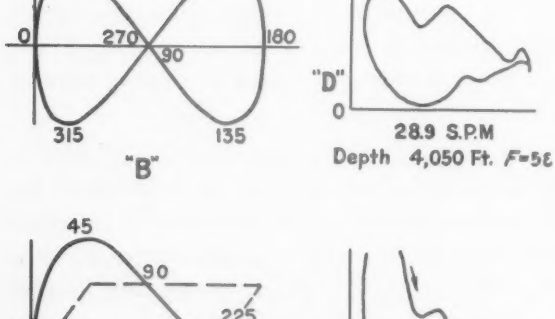


Fig. 2—Second order cards. From "Vibrated Problems in Oil Wells," J. C. Slonneger, A.P.I. Drilling and Production Practice, 1937, p. 183

Pump Dynagraph

For detailed study of the pumping cycle of a sucker-rod pump, a load-recording instrument, located directly at the pump is of particular value since the record it furnishes is not affected by many factors which distort the contour of a polished-rod dynamometer card. Such an instrument is the pump dynagraph. Located in the sucker-rod string above the pump, the pump dynagraph gives a diagram of plunger loads. Use of this instrument, particularly in conjunction with polished-rod dynamometer surveys, contributed greatly toward better understanding of the behavior of the pumping mechanism. The pump dynagraph is not used as generally as the polished-rod dynamometer for routine well investigations, but is applied in special well-equipment studies and in studies of wells which present particularly difficult problems.

The pump dynagraph determines the load on the plunger by recording the stretch of a calibrated rod installed in the sucker-rod string above the pump and coupled to the pull rod of the pump.[5] The record is made on a thin recording tube, enclosing the calibrated rod and fastened to one of its ends through a nut threaded onto the rod. The record is made by a stylus attached to a rotating tube. This tube encloses a portion of the recording tube and is set in a bearing on the other end of the calibrated rod. Thus any stretch of the rod causes the stylus to make a vertical line on the recording tube. At the same time the rotating tube, with the stylus, is made to rotate around the recording tube in a horizontal motion, proportional to the vertical reciprocating motion of the plunger. This rotating motion is caused by two spiral grooves in the rotating tube and two lugs, mounted at the upper end of the third tube, the cover tube. The cover tube, being attached to the pump body is stationary. With reciprocating motion of the sucker rods, the lugs of the cover tube ride in the spiral grooves of the rotating tube, causing this tube to rotate in a horizontal oscillating motion. For one complete motion of the plunger therefore the stylus makes a horizontal line on the recording tube. The resultant of the vertical motion of the stylus (due to calibrated-rod stretch) and of the horizontal motion (due to rotation of the stylus) is the pump dynagraph card. The card shows loads on plunger in relation to its position. By turning the rods at the well head the recording tube may be moved up on the calibrated rod making possible recording of several cards without pulling the instrument out of the hole. The rotating tube after being taken out of the instrument, upon completion of the test, is flattened into a sheet for inspection and reading of the card.

Dynagraph Card

A basic pump dynagraph card is shown in Fig. 3. Point A denotes the beginning of the upstroke[6] when the traveling value closes. The standing

valve is still closed because of the pressure of gas in the clearing space. From A to B, while the fluid load is transferred to the rods, the gas in the clearing space expands. At B the pressure in the clearing space becomes lower than the pressure outside of the pump the standing valve opens and the fluid begins to enter the pump. (In case of a pump handling, with 100 per cent efficiency, a gas-free fluid the curve A-B would be a straight vertical line from A.) From B to C, the remainder of the upstroke, full load of the fluid is on the rods. At C, the beginning of the downstroke, the standing valve closes but the traveling valve remains closed, while the gas is being compressed in the pump and the fluid load is gradually transferred to the tubing. At C the gas pressure in the pump becomes larger than the static pressure of the fluid in the tubing and the traveling valve opens. (In case of a pump handling, with 100 per cent efficiency, a gas-free fluid the curve B-C would be a straight vertical line down from B.) From C to A the plunger travels through the fluid to the point of beginning of the cycle.

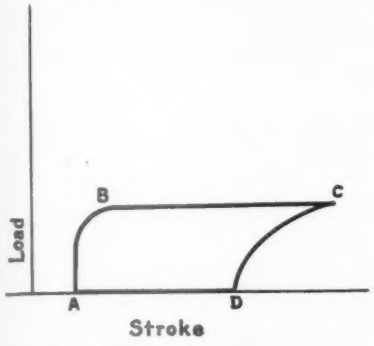


Fig. 3—Pump dynagraph card

Different characteristics of the pump affect in a different way the contour of a pump dynagraph card. Certain typical cards will be presented later in conjunction with discussion of specific problems.

Other Well Study Instruments

For an over-all detailed study of a pumping installation the polished-rod dynamometer and the pump dynagraph are not in themselves sufficient. Study of well characteristics is needed and useful, involving use of bottom-hole pressure gages, fluid-level measuring devices and bottom-hole oil samplers. Additional data on the performance of the equipment have to be secured in many cases through use of strain gages, installed on different parts of the equipment, engine indicators, tachometers and other instruments.

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A.S.T.M. Committee D-2 Recommends Test for Oil Content of Paraffin

THE recommendations of Committee D-2 of the American Society for Testing Materials, on Petroleum Products and Lubricants, at its recent annual meeting in Pittsburgh, Pa., included a new tentative test for oil content of paraffin which was developed for determining the percentage of oil in wax having a melting point of 105° or higher with not more than 10 per cent by weight of oil. The method involves dissolving the wax in methylethylketone, cooling to minus 25° F. to precipitate the wax, filtering out the methylethylketone containing the dissolved oil, and determining the oil content of this filtrate by evaporating the methylethylketone and weighing the residue.

The committee recommended for publication as information and for comment a test for saponification number of petroleum products by electrometric titration and also a proposed test for oxidation characteristics of steam-turbine oils based on extensive research investigations by a special section. In this latter method the oil sample is subjected to a temperature of 95° C. in the presence of water, oxygen, and an iron-copper catalyst, and the time required to build up a neutralization number of 2 in the sample is determined.

A number of changes were proposed in tentative standards to be incorporated immediately. In the Test for Knock Characteristics of Aviation Fuels (D 614-42 T) the minimum allowable air pressure is increased from 26 to 28 in. of mercury, which change was based on tests conducted at the National Bureau of Standards. These showed that the knock rating of some types of fuels varied by nearly one octane unit per inch variation of air pressure.

The changes in the Test for Knock Characteristics of Motor Fuels D 357-42 T) are largely editorial in nature and include a change in the guide curves in the portion above 90 octane number as a result of cooperative tests made by the Cooperative Fuel Research Committee.

Certain technical papers were presented of interest in the petroleum field including "A Method for Evaluating Performance in Service of Slow-Curing Asphalts," by Joseph Zapata, and "Accelerated Weathering of Bituminous Materials—Effect of Operating Variables," by Bruce Weetman. Mr. Zapata concluded "field and laboratory evidence indicate that a heat test of the type described in A.S.T.M. Method D 243-28 T can be used for the evaluation of performance in service of slow-curing asphalts.

"The test can be used for control time required to reduce the consistency of the asphalt from original to a consistency of either 100 or 150 penetration, or by specifying the consistency of the residue obtained after heating the asphalt for a given period of time."

Summarizing the results of tests on five roofing asphalts from different crude-oil sources, Mr. Weetman concluded that "the temperature of test must be accurately controlled if comparable results are to be obtained between laboratories. It is recommended that 140° F. black bulb panel temperature be used as the best temperature to obtain values which will adequately differentiate between the weathering characteristics of different asphalts in the shortest practical time.

"The electrometric method for detecting failure of panels is essential for accurate results on those asphalts which fail by the formation of fine cracks or pin points.

"Under normal conditions, amperage, refrigeration temperature, force of water washing, and surface cleanliness of the aluminum panels have no effect upon the test results."

Pamphlet on Tank-Car Loading Issued by A.P.I.

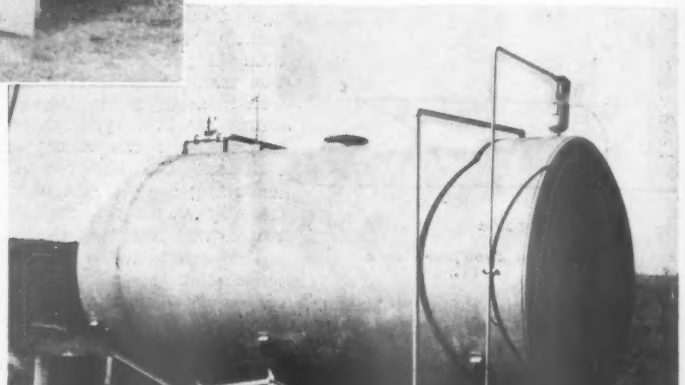
The department of accident prevention of the American Petroleum Institute has issued its Accident Prevention Manual No. 12, on "Loading Tank Cars (Gasoline)." The 16-page manual is liberally illustrated, the photographs showing practices designed to assist loaders in avoiding situations and mistakes which might result in fire and accident.

OPERATING IDEAS

Auxiliary Water Pump for Oil-Field Camp Fire Protection

PRESSURES maintained in the water system of a large oil-company camp in the Seminole, Okla., field for normal use are far from adequate for fire protection and other emergency needs. To take care of such contingencies, the system includes an auxiliary centrifugal pump driven by a 5-hp. electric motor and taking suction from the camp's reserve water supply tank. The pump is capable of building up a pressure of 180 lb. but is set for 150 lb. A pressure-relief bypass on the discharge line circulates water back to the reserve tank when the pressure in the system builds up to the set pressure. The unit is housed in a small shed adjacent to the water reserve tank. It is tested regularly each day as a precaution against failure in time of emergency. Its installation saves the operation of an oversize pump for normal needs.

Portable Boiler-Feed Water-Reserve Tank Unit



IN the assembly of drilling rigs used on the Gulf Coast particular attention usually is paid to unitization and portability of equipment with a view to facilitating tearing down and moving of rigs. In this picture is shown an easily moved boiler-feed water-reserve tank. Mounted on strongly constructed steel skids it can be dragged about readily as a unit. Movability is increased by the fact that the tank is supported horizontally, making it less likely to tip over and less subject to damage. Only three couplings are necessary to install the unit. The skid was constructed of piping with braced cradles to support the tank.

Extension Controls for Mud-Pump Valves

MUD pumps on a deep drilling steam rig were placed so that the control valves on the steam and mud discharge lines were located just below one side of the engine floor. The stems of the valves were fitted with rod extensions which placed the control wheels at a height to be operated conveniently from the elevated engine floor through a window cut in the side of the engine house. This results in an important saving of time and facilitates control of the valves without a crewman having to climb over a lot of piping as is necessary in many rig layouts. This is an important factor in an emergency.

How to Handle Anhydrous Hydrofluoric Acid With Safety

*by Charles M. Fehr**

This article is a slightly abridged version of an address the author delivered to Mid-Continent refiners at a meeting in Tulsa on July 9. It is particularly timely in view of the increasing use of anhydrous hydrofluoric acid in the petroleum industry.

BEFORE considering the various properties of anhydrous hydrofluoric acid, it is well to point out that at 98 per cent or higher, AHF is an entirely different compound as compared with the weaker forms previously used in commerce. As it increases in strength changes take place in gravity, boiling point, freezing point and, the most important of all, its attack on materials of construction. The gravity rises to a maximum of approximately 1.259 at 80 per cent strength and then drops off as the strength increases. Between 65 and 80 per cent the corrosive characteristics of HF change. For example, below 65 per cent it has a low corrosion rate on lead, while above 65 to 70 per cent it attacks lead increasingly rapidly. Again, below 60 per cent it has a high corrosion rate on steel, while above 80 per cent practically no action occurs on steel of good composition. Similarly, rubber, neoprene and many synthetic plastics show excellent resistance to weak HF but are increasingly attacked in strengths above 60 and 80 per cent.

As we are concerned here only with AHF as it is received and used in the refinery, and not in the alkylation process itself, it will be well to remember that we are dealing with AHF and that its problems are peculiar and different from the problems involved with the lower strengths. It may be regarded as on the border line between a true compressed gas and a corrosive liquid. As most of the experience of equipment manufacturers has to date been concerned with the handling of HF below 60 per cent, many of the exasperating corrosion problems previously experienced will be eliminated with this form of HF.

Principal Properties to AHF and Their Relations to Use

Certain properties have direct relationship to the problem of handling and are briefly outlined:

Freezing point, approximately —117.4° F. This unusually low value assures that it may be stored and used in process at very low temperatures without the problem of solidification.

*Chemist, Pennsylvania Salt Manufacturing Co., and technical adviser to Ozark Chemical Co.

For example, 66° B. sulfuric acid (93.19 per cent H_2SO_4) freezes at —29° F. Likewise, 98 per cent H_2SO_4 freezes at +36° F.

Boiling point, approximately 66.9° F. at atmospheric pressure. This is ideal, assuring ease of handling either as a liquid or a gas.

The vapor pressure, which is about 17 lb. per sq. in. gage at 100° F. assures storage in medium pressure vessels and its retention as a liquid at elevated temperatures without objectionable pressures.

The low viscosity and surface tension causes the acid to flow easily in comparatively small pipes. Less equipment is required and less time is consumed in transferring.

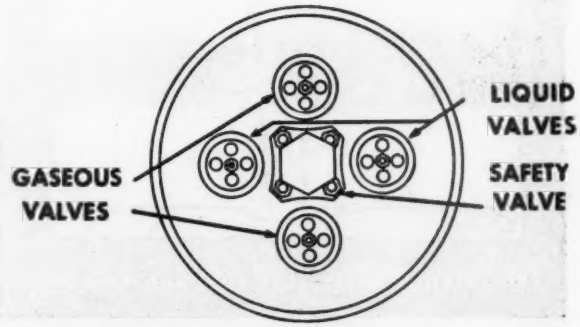
Satisfactory Materials of Construction

In our first work on the production of AHF in 1931, laboratory and pilot-plant tests were conducted to determine roughly which materials were satisfactory or unsatisfactory. While these tests were helpful in the development of an entirely new process, they did not tell the complete story. It was only after the process was actually in full-scale operation that real progress was made in determining desirable materials of construction. We found that because of its low corrosion rate mild carbon steel was excellent for handling AHF and was the logical material for storage tanks, pipes, fittings, valves, and pumps. The shipping-container problem has been solved by the use of steel. Apparently a protective coating forms on the surface of the steel inhibiting further corrosion. This becomes a problem on valves in that it will cause valves to freeze unless operated at fairly frequent intervals. This is probably because the film cements moving parts together. By opening and closing valves at least twice each shift this operating difficulty may be avoided. Obviously, double-valving is required.

Some steel is more resistant to AHF than others. A thoroughly deoxidized, dead melted, or killed steel in which the nonmetallic inclusions are absolutely at a minimum is the ideal steel. Bessemer steel is not desirable due to lack of precise control.

Our experience with monel has been satisfactory and it appears the best of all commercially available nonferrous metals for AHF. However, with the present restrictions on the use of nickel alloys, steel is preferable wherever possible. For the fabrication of laboratory equipment for handling AHF, such as sample bottles, valve parts, especially valve stems, and for parts in contact with weaker acid, monel metal is ideal and should be used.

Copper has been found satisfactory in various parts of the process. Under proper conditions it is a close second to monel. It is, however, attacked in the presence of sulfur dioxide and oxygen and, where these are present



Valve arrangement on tank-car domes used in handling acid is similar to equipment for transporting chlorine and ammonia

in the AHF, copper is unsatisfactory. We recently examined a copper coil, put into operation in 1931 for 2 years and recently returned to service, finding it in an excellent state today. Copper tubing is excellent especially where flexible connections are needed.

In addition to these metals, silver and platinum may be employed where construction justifies. Platinum is probably the most resistant of all metals to AHF and silver has very excellent resistance in the absence of sulfides or appreciable quantities of sulfuric acid.

Readers are cautioned to interpret these recommendations as applying to AHF only, since steel is not satisfactory for HF below 60 per cent. Copper, monel, silver and platinum are resistant to the weaker acids except under the specific adverse conditions noted in the foregoing. Platinum and silver are particularly useful for small parts or for special members such as frangible disks.

Unsatisfactory Materials of Construction

Among the unsatisfactory materials of construction, probably the most readily attacked are those containing silica, such as glass, porcelain, enamelware, asbestos, certain silica cast irons, etc.

While lead is serviceable for acids below 65 per cent, under normal conditions it is unsatisfactory for strong acids, especially AHF.

Cast iron is more resistant to AHF than lead but, probably due to silica inclusions, it is not a generally satisfactory material. Cast iron fittings will last only a comparatively short time before replacement.

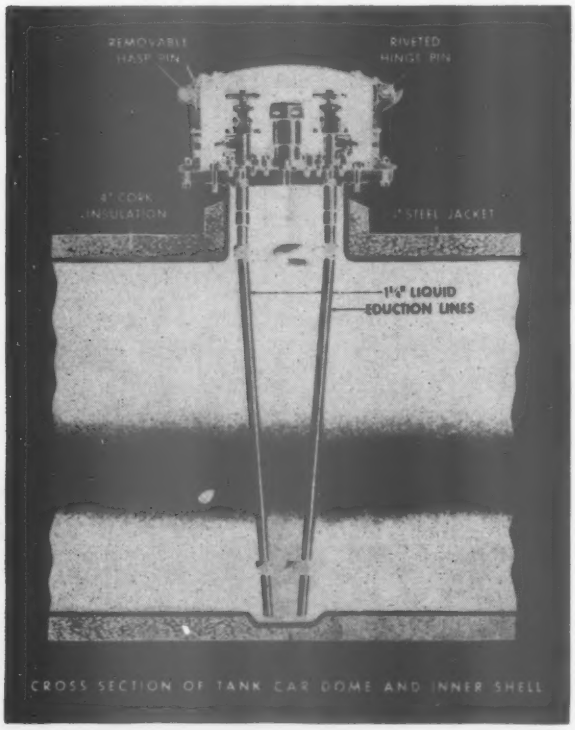
Among other materials found unsuitable for AHF are wood, which chars instantly; rubber, which polymerizers and hardens, and most plastics. We have hopes, however, for a nonflexible plastic which is now being studied.

Storage Vessels

Steel tanks are the logical storage vessels for AHF and should be of welded construction conforming to paragraph U-68 of the A.S.M.E. code for unfired pressure vessels. Proper outage must be provided and insulated storage tanks should not be loaded to more than 90 per cent of their water capacity—noninsulated tanks to 85 per cent. Where feasible, scale-mounted tanks are preferable to level indicators because of minimum error and trouble. Bottom outlets on storage tanks should be avoided wherever possible by loading and unloading through a standpipe. When bottom outlets on storage tanks are unavoidable a drop-plug valve should be provided as protection in case of valve failure. Storage vessels must be provided with a safety valve set to open at two-thirds of the working pressure of the tank and protected by frangible platinum disks.

Transfer of Acid

The transfer of AHF is a major problem which may be accomplished in two ways: by pressure padding with dry air or an inert gas, such as butane, or by pumping.



CROSS SECTION OF TANK CAR DOME AND INNER SHELL

Pressure padding is indicated for the transfer of a volatile liquid such as AHF from tank cars and storage tanks equipped with well pipes. Pressure on the receiving tank must be depressed by occasional venting of gas from the top of the tank. In the manufacturing plant this gas is recovered in the absorbing system but in the refinery it should be absorbed in an alkaline scrubber. The chief advantage of pressure padding is the elimination of pumps and bottom outlets on storage tanks. The packing problem on acid pumps is serious where strict acid specifications preclude the use of a special liquid-hydrocarbon pressure-seal packing gland.

The alternate method of transfer is by means of centrifugal or positive-displacement type pumps. For satisfactory operation these must be fed from a bottom outlet in a tank in order to avoid vapor lock. Packing problems on centrifugal pumps used in the refinery are minimized by specially designed liquid hydrocarbon pressure sealed glands.

Flowmeters and weigh tanks are both used for the measurement of acid to process.

Piping

Extra-heavy seamless steel pipe and forged steel fittings are preferable for handling AHF. Welding makes the ideal joint, provided the weld is homogeneous and free of slag and oxides. Welded fittings should be used wherever possible. If threaded joints are used on small pipe, the threads should be carefully cut, pulled up tight and seal welded. Some designers do not seal weld pipe under ½-in. size, reporting threaded joints satisfactory.

For connecting pipe larger than 2-in., ring flanges with soft iron or copper gaskets are satisfactory. Neoprene or vistanex impregnated asbestos gaskets have been successful especially on small lines.

Heavy copper tubing is satisfactory for flexible connections to scale-mounted tanks.

Valves

Needle, globe and gate valves have been used successfully. Whenver application permits, we prefer a needle or globe valve due to sturdy construction. Steel is an excellent construction material and valves may be machined from bar stock or forged. Cast-steel valves if used must be carefully examined for porosity and sand holes. Deep stuffing boxes and outside screw and yolk are desirable. The principal difficulty with all steel valves is freezing of the seats and corroded stems. Regular operation of the valve reduces freezing and monel trim valves, especially stems, are an excellent freezing preventive. Corroded stems may be avoided by keeping the packing glands tight.

Our experience with lubricated cocks in AHF service has not been satisfactory, due to an unsatisfactory lubricant. We understand that improvements in design and lubricants have eliminated the difficulty. The principal advantage of lubricated cocks is the elimination of packing problems.

Pumps

Cast-steel centrifugal pumps with steel impellers have given good service with the exception of packing difficulties. Packing problems on this pump have been greatly reduced by the use of liquid hydrocarbon pres-

OIL ZONES OF THE UNITED STATES

Triassic-Jurassic

(Compiled by The Oil and Gas Journal)

PRINCIPAL PRODUCING HORIZONS:

Sandstones: Cotton Valley of southern Arkansas and northern Louisiana, Sundance and Morrison of the Rocky Mountain states.

Limestones: Smackover of southern Arkansas and northern Louisiana.

DISTRIBUTION OF PRODUCING AREAS: Following the Appalachian revolution, there was widespread erosion of the land surface with deposition of salt in the Permian followed by red bed deposition. This continued into the Triassic but during the Jurassic the sea invaded the continent from the Gulf of Mexico and the North Pacific. In the Gulf area, the first sediments laid down were red beds followed by salt which is overlain by the Smackover limestone, the principal producing horizon in a belt of fields extending parallel to the state line dividing Louisiana from Arkansas with most of the production to the north. Following deposition of the Smackover limestone, the sea retreated and red beds form the overlying deposit. The next marine series, the Cotton Valley produces along an even narrower belt, the principal field containing this pay being at Shuler.

In the Rocky Mountain district, the Sundance of Jurassic age overlies the Chugwater Triassic red beds and produces in the Wind River, Green River and Powder River basins. Production in western Colorado and Utah from the Morrison suggests that it may prove productive over a much wider area. In Montana, the Ellis formation, which is equivalent to the Sundance produces at Kevin-Sunburst immediately above the unconformity separating Jurassic from Mississippian beds.

EXTENSION INTO OTHER AREAS: There is practically no possibility of finding oil in the Triassic anywhere in the United States.

There have been numerous attempts to extend Jurassic production westward from the Arkansas area into Texas but without success. The limiting factor seems to be the distribution of porosity which probably resulted from erosion during the period that the formation was uncovered by the retreat of the sea. The southern limit of this retreat is not known. To the north of the producing area, the formation wedges out between overlying beds and the folded Pennsylvanian rocks below.

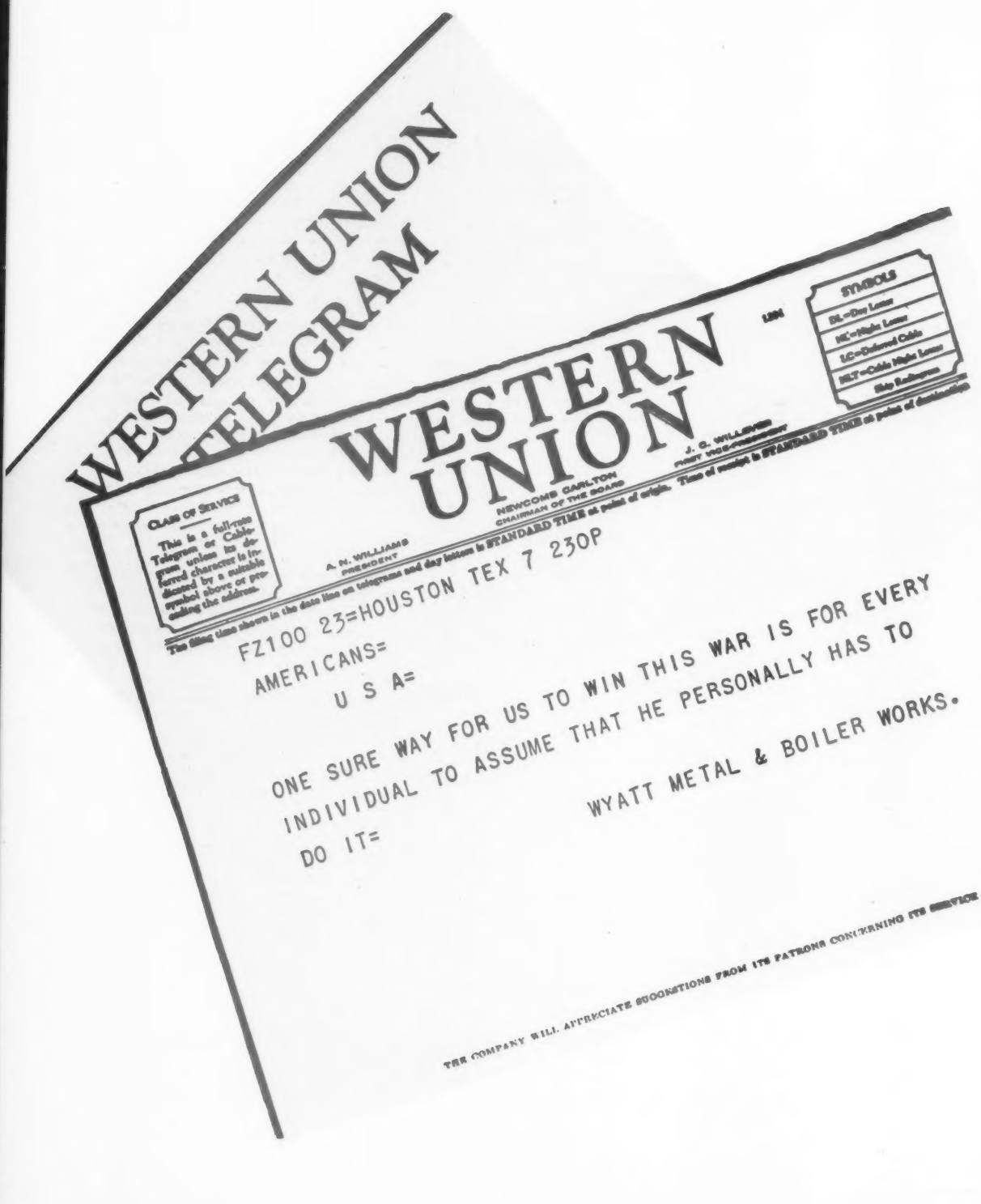
Beyond the northern part of the East Texas basin, few wells have penetrated the Jurassic and practically nothing is known of its occurrence. In Mexico, the productive El Abra limestone has been thought to be of Jurassic age but most authorities now place it in the Cretaceous. Definitely Jurassic rocks have been found in Mexico and oil has been reported in them but there has been, as yet, no commercial production from this system. The possible extension of Jurassic pays south and west of Arkansas is, therefore unknown. East of the producing area in Arkansas, the Jurassic has not been tested to any extent.

The northern Pacific embayment spread into the Rocky Mountain area during Upper Jurassic, during which time the Ellis and Sundance formations were deposited. These are found in all of the basins in the northern and eastern part of the area, extending into southwestern South Dakota, northwestern Nebraska and central northern Colorado. As the formations were deposited on an old land surface by an advancing sea, they provide numerous possibilities for stratigraphic traps as well as for production on structure.

The Morrison is mainly a fresh-water formation and is not expected to yield much oil. However, the fact that it does produce at Wilson Creek in northwestern Colorado and in small pools in Utah makes it a possible objective in the western part of the area. Farther south, the Jurassic formations are mainly red sandstones and limestones and are not expected to yield production.

GENERAL GEOLOGICAL CONSIDERATIONS: The fact that the greater part of the continent lay above sea level during the Triassic and Jurassic periods makes the horizons underlying the Lower Cretaceous of particular importance as potential stratigraphic traps. Over the Great Plains region from Montana into northern Canada, the underlying formations are limestones which range in age from Devonian into the Pennsylvanian providing a wide range of possible oil reservoirs of which only the Madison has yet proved to be important.

In the southwestern part of the country where both systems are made up mainly of continental deposits, correlations are difficult and surface geology generally indicates little or nothing of the potentialities of the underlying rocks. Greater dependence must, therefore, be placed on geophysical methods of exploration or on test drilling through the Mesozoic beds and, in the Permian basin, through the underlying Permian red beds, salt and anhydrite.



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(Continued from Page 40)

sure seal glands, but this application is not always permissible due to acid contamination.

Small positive - displacement - type pumps constructed of steel, monel or special bronze have given good service; they are inexpensive, and we have found them more trouble-free for our operations than the centrifugal pump.

Packing

Obtaining suitable packing for pumps and valves and sheet packing for flanges is one of the most difficult problems encountered in handling AHF. However, packing manufacturers are developing improved packings and this difficulty is apparently being solved.

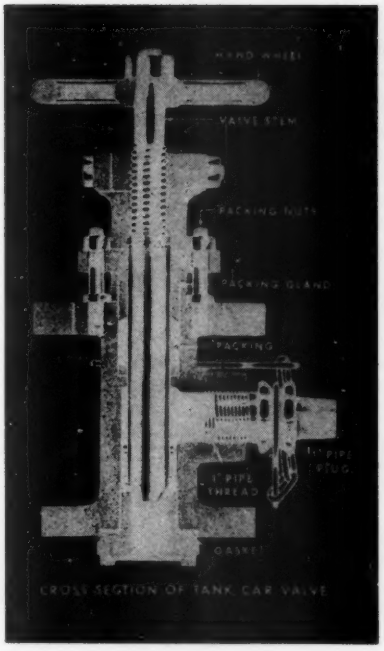
The ideal pump packing should be resistant to the acid, have compressibility and should not score the shaft. Resistance to the acid is obtained by use of copper or aluminum foil, or copper metallic braid. Compressibility is obtained by the use of heavily graphited and lubricated asbestos, neoprene or koroseal cores, which have been moderately successful. Anchor packing having a braided copper covering with a heavily graphited asbestos center, has been used with reasonable success for packing pumps and valves. A copper foil packing, with some of the rings containing a neoprene or koroseal core, is satisfactory for both valves and pumps. It is to be expected that pumps and valves packed with the best available materials will require regular inspection and removal of packing at intervals. Packing deteriorates at a higher rate on idle pumps and packing life can be conserved by starting up the pumps several times each shift. On larger valves with deep packing glands lubrication supplied through a lantern in the center of the gland is desirable to prolong the life of the packing.

Recommendations on Construction

Neoprene or vistanex-impregnated asbestos sheet has been successful for flange packing. A flange joint gasket of this kind is not as satisfactory as metal gaskets. Tygon has shown promise in preliminary tests and may prove superior to impregnated asbestos sheet.

Welded joints are ideal for AHF and welding should be used wherever possible in the construction and erection of equipment, and should be used to seal threaded joints on small lines. Welds must be full, homogeneous and free of inclusions of slag and oxides. We have found a reverse polarity welding rod of the same composition as the material being welded desirable.

Avoid overhead lines and slope acid lines to storage or drain tanks wherever possible. If pockets in acid-transfer lines are unavoidable, methods of draining must be provided.



It is best practice to install valves below eye level with the packing glands vertical. The use of double valves is often indicated, and, in the case of global valves, it simplifies repacking. Valves and pumps should be readily accessible avoiding location in pits and areas congested with equipment. The repair of this equipment is not simple and may be greatly facilitated by proper placement. Open areas allow men to work on the windward side.

Wire for motors should be run in conduit and connections to motors made in flexible metal conduit.

Glass is very readily attacked by HF fumes and will cloud up very quickly. Although plastic (polystyrene) is not perfectly resistant to HF over a period of time, it is superior to glass and is satisfactory as a substitute for glass in gages and instruments. Cellulose-base lacquer may be used for protecting glass.

After construction has been completed, all lines should be pressure tested for leaks before operation begins.

Safety Practices

As the safe handling of AHF is essential to successful plant operation a study of safety practices is well worth consideration. The refining industry, long accustomed to handling hazardous materials, should solve its AHF safety problems without undue difficulty.

Although safe handling of any dangerous chemical is largely the function of materials of construction and design, the human element also plays an important part. The selection of personnel should be based on ability to follow orders and obey safety instructions. The men should think straight and act quickly in cases of emergency. They should respect the material they are to handle, but they must not be afraid of it. A man who is afraid of his work is a liability and should be transferred; otherwise he may some day be responsible for injury to himself or others. It should be clearly recognized that certain men are unsuited for work with AHF due to the fact that even slight concentrations of fumes will cause severe nasal and throat irritation. People who sunburn readily usually burn easily from the fumes of AHF and when working where these fumes are apt to be encountered should wear proper protective clothing. Zinc oxide powder applied to exposed skin surfaces minimizes the danger of burning. A special HF ointment containing magnesium oxide may also be used for this purpose.

In the safe handling of AHF, periodic inspection of premises and equipment, including tools and safety appliances, is imperative. Regular inspection of acid lines, valves, pumps and equipment will detect leaks at their beginning, spot potential trouble and avoid costly repairs and injury. It is wise to make sure that tools and safety equipment used by the men are in good order and adequate. Repairmen should be thoroughly familiar with the AHF equipment in use and with methods of repairing it. They should also be familiar with the required use of safety equipment for each job. These men must be reliable and must adhere to prescribed safety rules. Remember always that the safe handling of any dangerous chemical depends upon keeping it confined and off the skin, and all safety practices should be devised with these goals in mind.

All equipment scheduled for repair should be considered full of acid until it has been definitely established as empty. Tanks, pumps, lines and valves that are to be repaired should first be drained, flushed and evacuated. Workmen should never be allowed to attempt repair of equipment while pumps are in operation and the lines full of acid. If pipe sections are to be removed and flanges opened, the lower bolts should be loosened first and, although the lines may have been flushed, care should be taken to avoid any drip. Graphite on threads facilitates removal.

Employes should be instructed never to stand in front of an open acid line or in front of a valve while it is being opened.

If it is necessary to remove sections of lines by cutting with a torch, be doubly sure that the lines have been drained, flushed and evacuated before starting work. Operators engaged in this type of repair work where spatter is possible should wear full protective clothing. The hazard of hydrogen explosion is prevalent when cutting into empty acid lines

or empty acid tanks, especially if they contained weak acid. This hazard can be minimized by adding dry ice to the receptacle or line before starting repair work. AHF is not in itself an explosive.

Equipment, such as valves, motors or fittings, removed from acid service should be identified with a distinctive marking and thoroughly washed with an alkaline solution before being handled. All workmen should know the meaning of this marking and should never touch articles of this type with bare hands or without proper protective clothing.

Each repairman for AHF equipment should be provided with a complete set of tools and should never allow other workmen to handle them. These may at some time be contaminated with acid and men not properly protected with gloves or clothing may be burned. Tools used in acid repair service should be thoroughly neutralized with a solution of soda ash after each use. An effective way to prevent rusting is to dip them in kerosene after washing.

Employes should make a practice of never unduly exposing the skin when working in the acid section, and should wear full coverage of clothing at all times. Working bareheaded, with shirt sleeves rolled up or in an undershirt is exceedingly hazardous in an acid plant. Neoprene-soled shoes or rubbers, a hat or protective head covering, face mask or goggles and neoprene guantlet-type gloves are indicated at all times. In addition a neoprene-coated apron is advisable and a complete neoprene-coated suit should be worn when repairing AHF equipment. Our workmen prefer the medium-weight gauntlet glove to the thin glove. The thin glove offers greater freedom but tears more readily and has been the cause of minor burns. Neoprene gloves should be thoroughly washed, inside and outside, and pressure tested for leaks before use. The habit of removing or raising goggles with soiled gloves should be cautioned against as it is often the cause of burns. We have found the use of a portable blower or fan helpful in whisking away fumes when tightening packing glands on valves.

Service lockers should be supplied for each operator in which to keep equipment used daily and it should be the duty of the foremen to see that this equipment is properly maintained and that replacements are made when necessary. A sink with ample water supply should be provided for cleaning and washing tools. We have found a bottle of Universal Wide Range Indicator very helpful for determining the presence of HF on garments or tools and it can be used to advantage by the inspector to determine if the rule relative to the washing of equipment and tools is being executed. Automatic safety showers should be located near pump houses or areas where maximum repairs may be indicated. These showers must be connected to a plentiful supply of tepid water, and the type of shower which automatically operates an alarm when occupied is preferable. Prompt aid is essential in cases of burns from AHF and the alarm system will indicate that a man needs aid.

First Aid

In all cases of injury call a physician familiar with the treatment of hydrofluoric acid burns and use these suggestions only as a means of reducing injury to human beings or mitigating suffering while waiting for the doctor's arrival.

The three important fundamental steps in first aid for AHF burns are:
Promptness.

Prolonged and thorough flushing with water.

Treatment for shock.

AHF attacks tissue rapidly and it is important that first-aid treatment be given immediately. If a workman is burned with AHF, properly trained first-aid crews should be called instantly and respond without delay.

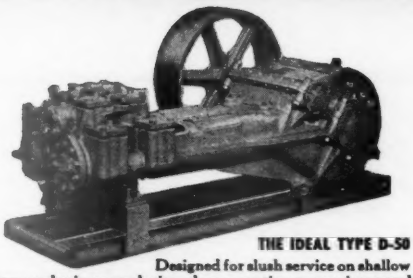
In addition to reacting immediately with the tissue AHF will continue to destroy tissue until it has been removed. The most effective first-aid measure is the application of large quantities of tepid water. This will flush the HF from contaminated clothing as well as from the skin and will reduce injury. The treatment we use for AHF burns depends upon the removal of the acid from the tissues by prolonged soaking in water and several severe burns which we experienced responded excellently to this treatment and recovered fully. The skin after contact with AHF has a peculiar marble-white appearance. After prolonged washing with water and removal of the acid the burned area will assume a natural pinkish color and this is an indication that sufficient flushing has been given. We have found that it is necessary to apply the water for a period of 3 to 5 hours for average burns and in the case of a very severe burn water was applied after hospitalization for a total period of nearly 12 hours. Due to the necessity of treating for shock and keeping the patient in a prone position, the water should be applied to the burned area through spray nozzles after the first initial shower flush of 5 to 10 minutes, preferably longer if shock is not too severe.

Some authorities state that they have obtained excellent results by the application of a water flush followed by alternate flushing with weak ammonia and water. Others apply a special HF burn ointment, containing magnesium oxide, after the flushing period. Another method reported to be successful is the subcutaneous injection of calcium gluconate solution to precipitate the fluorine ion in an insoluble form. The whole treatment for HF burns is designed to counteract the double action of the acid: the acid action, and the fluorine ion action. It is stated that the fluorine ion must be removed from the tissue to prevent deep-seated, slow-healing sores and it is a matter of opinion as to which method will accomplish this best. At least the methods are all similar in that they require copious flushing with water and if this rule is followed the first aid crew cannot go wrong.

Pain is not experienced immediately on contact with the acid and in some cases does not occur until several hours later. Thus, workmen may receive burns and go home at the end of their shift without knowing that they have been burned. If they are not familiar with proper treatment they may use home remedies. We have had several cases of very stubborn, hard-to-heal burns following the application of grease or oil-base home remedies to the burned area without thorough flushing. Burns under the fingernails come in this classification and may result from long exposure to strong fumes, sometimes experienced by laboratory workers, or from improperly washed or defective gloves. Soaking the burned hand in a basin of cold water for a long period of time will usually give relief and the patient may even receive a full night's sleep by placing the basin alongside the bed.

Small concentrations of HF fumes in the atmosphere are easily recognized and usually cause coughing and irritation of the throat. Prolonged exposure to heavy concentrations may cause lung inflamation. We have never experienced any serious accidents due to burns from fumes and can only conceive of an accident of this type happening due to the operator being trapped or becoming unconscious in a heavily contaminated area. Fresh air, rest, treatment for shock, including prone position, reassurance and, in the case of stoppage of breathing, artificial respiration would be naturally indicated pending the arrival of the physician. Workmen entering areas heavily contaminated with fumes should wear full protective clothing, including supplied-air hood-type mask.

Eye burns are usually the result of a direct splash of acid in the eye and may be avoided if proper protective equipment, such as goggles, mask or face shield, is used as indicated by the safety rules. In case of an actual splash of acid in the eye, the eye should be immediately flushed with large quantities of water. After the eye has been thoroughly washed, normal saline solution may be applied, but in all cases of eye burns it is good practice to have the man examined by a competent physician specializing in treatment of the eyes.



THE IDEAL TYPE D-50

Designed for slush service on shallow rotary and seismograph rigs—has operating convenience and dependability of larger slush pumps—5" x 10" bore and stroke—1000 pounds maximum working pressure—50 maximum rated hydraulic horsepower at 60 r.p.m.

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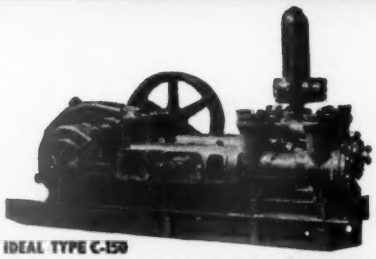
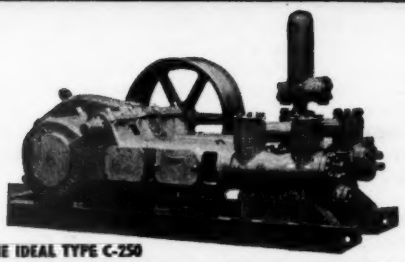
The continued extension of rotary drilling into the shallower fields and the trend to reduced diameter holes have created a demand for a smaller power driven slush pump with the same relative drilling efficiency as the larger deep hole types. The Ideal Type C-100 Power Driven Slush Pump is especially made for these requirements. It has the same general design as the larger Ideal Type C Power Driven Slush Pumps—10" x 5¾" bore and stroke—1500 pounds maximum working pressure—100 maximum rated hydraulic horsepower at 65 r.p.m.



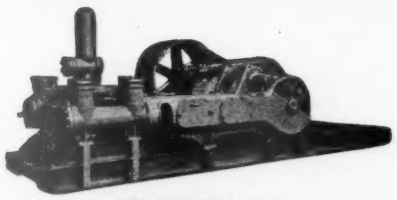
THE IDEAL TYPE C-150

For portable and semi-portable rigs and semi-shallow drilling—6¾" x 12" bore and stroke—2000 pounds maximum working pressure—150 maximum rated hydraulic horsepower at 65 r.p.m. Due to higher operating speeds will deliver a greater amount of fluid at higher pressures and less hose whip.



THE IDEAL TYPE C-250

For ordinary deep drilling requirements—7¼" x 15" bore and stroke—2500 pounds maximum working pressure—250 maximum rated hydraulic horsepower at 60 r.p.m. Adaptable to all types prime movers—shorter, more portable with no sacrifice in volume and pressures.



THE IDEAL TYPE C-350

For the deepest regular drilling—7¾" x 18" bore and stroke—3000 pounds maximum working pressure—350 pounds maximum rated hydraulic horsepower at 55 r.p.m.—power and pressure ratings allow duplication of corresponding size steam pump performance.

Model No.	Max. Liner Size	Stroke	Max. Working Pressure	Pressure Rating of Full Size Liner	Rated Speed	Rated H.P.	Weight Pounds
D-50	5"	10	1,000	450	60	50	5,725
C-100	6¼"	10	1,500	520	65	100	12,250
C-150	6¾"	12	2,000	550	65	150	17,000
C-250	7¼"	15	2,500	710	60	250	28,975
C-350	7¾"	18	3,000	800	55	350	36,400

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PROGRESS IN METALS

by W. L. Nelson

Cast Irons for High Temperatures

Abstract of A-3 Subcommittee Report of A.S.T.M. Buffalo, New York, March 2, 1943

Members of this committee assembled for their initial meeting. Members of the American Foundrymen's Association committee on the same subject were invited to attend. Some 35 to 40 representatives of all groups were present. The origin of the committee, which was formed by resolution passed at the June 1942 annual A.S.T.M. meeting, was described, and the events that followed, leading up to cooperation from the American Foundrymen's Association. Simultaneously, the interest of the Government in utilizing the productive capacity of the foundry industry for making cast iron equipment, led to a study of the subject by the war metallurgy committee.

The main feature of the meeting centered about a discussion of the assembled opinion of representatives of various manufacturing interests who employ cast iron at elevated temperatures, and a preliminary report upon the findings of the war metallurgy committee was presented. The report classified its findings into four temperature ranges covering applications from:

450° to 600° F.—pressure vessels
600° to 750° F.—pressure vessels
750° to 1,000° F.—engine and fire-box castings
Over 1,000° F.—engine and fire-box castings.

The discussion revealed that the application of cast iron to pressure vessels had not been surveyed since 1914, and at that time cast iron with a tensile strength of 20,000 lb. per sq. in. was considered of good quality. The 1914 survey revealed that no trouble had been experienced in pressure applications operating under 450° F. and 150 lb. pressure, and these limits were naturally accepted. The comments at the time indicated that if a 30,000-lb. iron had been available higher temperatures and pressures would have been allowed.

Since that time, the strength of cast iron has been more than doubled. The war metallurgy committee's report revealed that many pressure applications operate successfully at temperatures above 450° F. They also revealed that in the higher temperature ranges cast irons are correspondingly high quality types, and more than 50 per cent of that represented processed or inoculated cast irons of the latest metallurgical high-grade types.

Representatives of various industrial groups at the Buffalo meeting expressed the opinion of their industries regarding the properties and performance of cast iron under the conditions which their equipment encounters in service. There were comments concerning design factors which limited manufacture in the foundry to specific types of castings; other comments concerning the overdesign of parts such as valve castings, which might be readjusted by dividing designs into large and small diameter members.

Further comments on stress concentration in pressure castings and upon heat transfer in direct-fired vessels, which were under little or no pressure, were made. There was some mention of the need for extreme care in turbine construction. Others mentioned the favorable performance of cast iron in steam or hot gases under dry wear conditions.

It is the purpose of the committee to assemble these data and review them. It is then the plan to (1) discharge the work of the committee by summarizing the information available on specific industrial applications, (2) analyzing the data with a view toward defining the quality and capacity of cast iron for elevated temperature service, and (3) recommending problems in connection with this work which require further study.

Boron in Steel

The use in extremely small amounts of the element boron in steel, amounts ranging up to about 0.007 per cent, has a pronounced effect on the strength and does not harm the ductility to an important extent. An S.A.E. 1035 steel was improved in properties as shown here, by the addition of 0.003 of boron.

	Plain	With boron
Ultimate strength, lb. per sq. in.	109,000	124,000
Elastic limit, lb. per sq. in.	85,000	109,000
Elongation, per cent	22	21
Reduction of area, per cent	62	60

These results were obtained on 1-in. rounds quenched in oil from 1,500° F. and drawn at 1,000° F.

Most success is expected with steels that are heat treated by quenching and drawing. In terms of other alloy elements, boron will replace the following amounts of other elements—

	Per cent
Nickel	1.0
Chromium	0.3
Manganese	0.2
Vanadium	0.12
Molybdenum	0.10

According to T. W. Lippert,[1] boron is characterized by a high affinity for oxygen and is therefore an excellent deoxidizer. It is added to the steel after the steel has been completely deoxidized, or it is accompanied by enough strong oxidizers to protect it until it dissolves in the molten steel.

Amounts of 0.002 and 0.003 per cent are thought to be most effective, and amounts of 0.007 per cent or more result in serious trouble with hot shortness. It is not very effective on steels that contain less than 0.2 per cent of carbon and the steels that contain over 0.6 per cent carbon already have sufficient hardenability in small sections but may be somewhat improved by boron in larger sections.

The pyramiding usefulness of high strength in the metals that are used for petroleum production equipment makes the announcement of boron-treated steels of major importance. Such increases in strength may permit development of oil strata far below explored depths.

References

1. T. W. Lippert, Iron Age, Vol. 150, Nov. 19, 1942, page 41.
2. A.S.M. Symposium, Metal Progress, Vol. 42, Dec. 1942, page 1061.
3. N. F. Tisdale, Blast Furnace & Steel Plant, Vol. 31, Jan. 1943, page 93.
4. Geo. F. Comstock, Metals & Alloys, May 1943, page 978.

Metallurgical Terms

Basic Steel

Basic Open Hearth Steel is steel that has been melted or produced in a furnace which has a basic bottom and lining, and under a slag that has a basic reaction. The main constituent of a basic lining is magnesia, and the somewhat frail physical nature of this material requires relatively frequent replacement of the bottom and lining of the furnace.

DISPOSAL LINE COST COMPARISON

SELECTION of the most economical operating method or installation is one of the most frequent problems encountered in engineering practice. Before any particular installation is selected or recommended, all alternate methods for accomplishing the same result should be fully considered and a cost comparison prepared.

Such a cost comparison is shown in the present example, which involves the handling of lease waste-water production from a central salt-water pit to a disposal well, 4,200 ft. distant.

PERTINENT OPERATING DATA

Present water production, bbl./day	768
Future maximum water production, bbl./day	3,100
Economic life of lease, years	5
Present waste-water line, feet of 3-in. pipe	4,200
Available head by gravity flow, feet	16
Specific gravity of salt water	1.150

Two years previously a line consisting of 4,200 ft. of 3-in. pipe had been installed to handle the water production by gravity flow.

Problem.—The capacity of the present 3-in. line (768 bbl. per day) has been reached and the future maximum water production is estimated to be 3,100 bbl. per day. What is the best method for handling the water production?

In this particular problem, at least two different installations are feasible. Pumping equipment can be installed to handle the water production through the present 3-in. line or larger size pipe can be installed to handle the water by gravity flow. Before making a cost comparison it is necessary to determine the size of pipe necessary for gravity flow and to determine what size and kind of equipment will be necessary to pump water through the 3-in. line. This can be conveniently determined by a chart such as Fig. 1, or by hydraulic tables. As will be noted from the chart, a 6-in. line would adequately handle the future water production by gravity flow. For pumping equipment, a pump capable of handling 3,100 bbl. per day at 97 lb. per sq. in. pressure would be necessary. A selection of pumping equipment in itself involves a cost comparison as well as engineering and operating considerations.

In the present example, a unit consisting of two centrifugal pumps in series, powered by a 18-hp. multicylinder gas engine was selected.

A cost comparison of the two methods is shown in Table 1. The investment charge includes all costs incident to the installation of new equipment, such as material, company and contract labor, hauling and overhead charges. If old equipment can be recovered at the time of the new installation and can be sold or used in operations elsewhere, the value should be deducted from the investment charge. The estimated salvage value of the new equipment at the close of operations (in this case 5 years) is also deducted from the investment. In some instances, an interest charge is made on investment.

The second item, operating and repair expense over the remaining life of the lease, includes estimated repair expense for the installation (usually based on past experience and records), operating expense such as fuel and lubricating oil, and labor necessary for operation of the installation.

It will be noted from Table 1 that Method 2 is estimated to be $2,232 cheaper than Method 1 for 5 years of operation. Before making a recommendation, however, the engineer should take into consideration company policies and practices. For instance if Method 1 had proved to be cheaper, many companies would still have preferred Method 2, providing that the difference in cost was not too great.

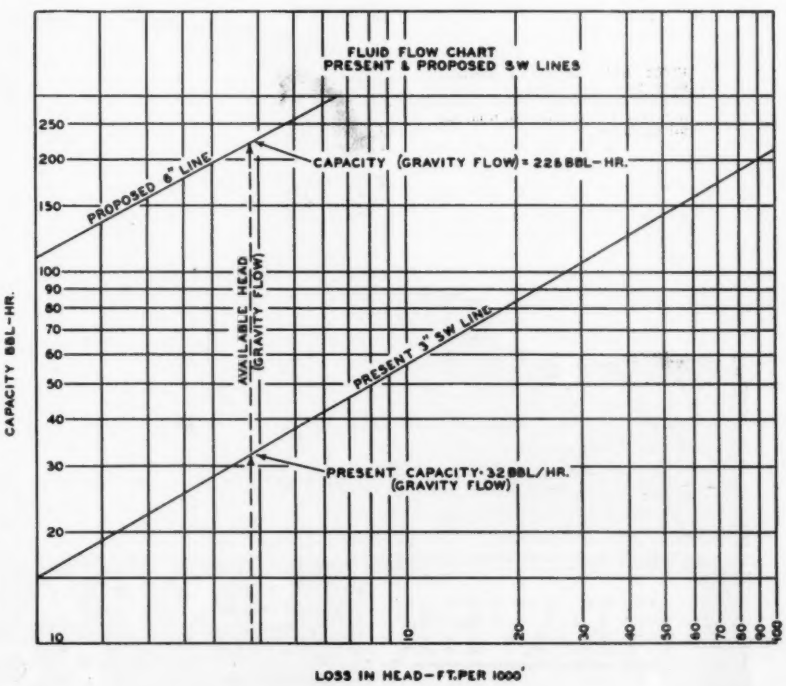
TABLE 1

Method 1.—Install two centrifugal pumps in series, powered by 18-hp. multicylinder gas engine and pump water through present 3-in. line.

Investment	$1,020	
Estimated salvage value—5 years	520	
Investment loss		$500
Operating and repair expense—5 years		4,200
Total cost—Method 1		$4,700

Method 2.—Lay 4,200 ft. of new 6-in. pipe and dispose of water by gravity flow.

Investment	$3,758	
Estimated salvage value—5 years	840	
Investment loss		$2,918
Operating and repair expense—5 years		550
Total cost—Method 2		$2,468
Difference in favor of Method 2		$2,232



Putting a *Padlock* on Vapors

Graver Expansion Roof provides a practical and economical means of preventing evaporation losses from working tanks, for with this equipment there is no breathing out of vapors and no breathing in of moisture laden air. The Expansion Roof, oil sealed all around, rises or falls as the vapors expand or contract. Result — no loss of gallonage and no lowering of octane rating.

Furthermore, if tanks are spaced reasonably close together, several of them can be manifolded to a single Graver Expansion Roof tank of suitable size, providing multiple savings with but one Expansion Roof installation. And this system applies with equal efficiency to refinery units or terminal operations.

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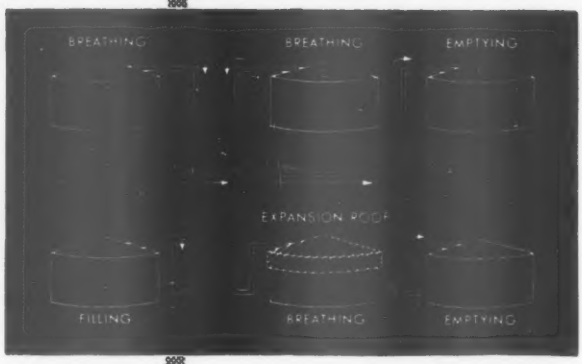


Diagram shows a typical hook-up for a terminal operation. The vapor spaces of the ordinary cone roof tanks are manifolded together and to the Graver Expansion Roof tank which retains all the excess vapors forced out of the cone roof tanks by variations in volume or temperature.

10,000 bbl. Graver Expansion Roof tank protecting a battery of cone roof tanks from evaporation losses at terminal of a major oil company.

GRAVER EXPANSION ROOF

43-14-8

COST FACTORS OF GAS LINE REPAIR

LEASE gas lines which may be leaking appreciable amounts of gas are frequently major sources of trouble for the operator. The advisability of repairing such lines depends upon a number of economic factors, these being: amount of gas leakage, the price of the gas, estimated expenditure necessary to repair the lines, the condition of the pipe, and expected period of use.

The effect of these factors upon a decision to repair the line is illustrated in the present example, concerning a consumer line on a four-well lease. There is a discrepancy between the estimated gas requirements and the meter readings, which fact serves as an indication that the line is leaking. The gas is being purchased at a price of 16 cents per 1,000 cu. ft.

Problem.—Determine the amount of leakage and the economic advisability of repairing the line to prevent leakage.

Determining Amount of Leakage

Various methods are used by different operators to determine the amount of leakage from gas lines. Most of these are variations of the so-called "pressure drop" method. The following is typical of the test procedure and calculations which are used. The lease line, in the present example, is divided into four different sections (designated as A, B, C, and D in accompanying chart) by installing "bull plugs" on the high-pressure side of the regulators and at the junctions. Each of these sections is filled with gas compressed to a pressure ranging between 60 and 80 lb. per sq. in. An accurate pressure gage is used to measure the drop in pressure, a number of readings being obtained over the time interval of the test. Gage pressure vs. time is then plotted on semilogarithmic paper, which plot gives a straight line as shown in the accompanying chart.

The amount of leakage is calculated by the following formula:

$$Q = \frac{309.5\ V\ S}{460 + T}$$

where:

Q = amount of leakage in 1,000 cu. ft. of standard gas per year at the gas line operating pressure and temperature.

V = volume of the gas line, cu. ft.

T = temperature of gas under operating conditions, deg. F.

$S = \frac{dp}{dt} = kp_w$ = the instantaneous rate of pressure drop, lb. per sq. in. per hour

$k = 2.303\left(\frac{\log_{10} p_2 - \log_{10} p_1}{t_2 - t_1}\right)$ = the exponential slope of the curve where p_2, t_2 and p_1, t_1 are any two points on the straight line plot on semilogarithmic paper

p_w = gas line operating pressure, lb. per sq. in., gage

The amounts of leakage in 1,000 cu. ft. per year for the four sections of the gas line are shown in Table 1.

Economic Factors

Any decision to repair the gas lines will depend upon the price of gas. The annual loss from gas leakage is shown in Table 1. This loss has been computed, using a price of 16 cents per 1,000 cu. ft. Gas rates are usually based on a sliding scale; however, the loss from leakage is usually based on the lowest rate charge per 1,000 cu. ft.

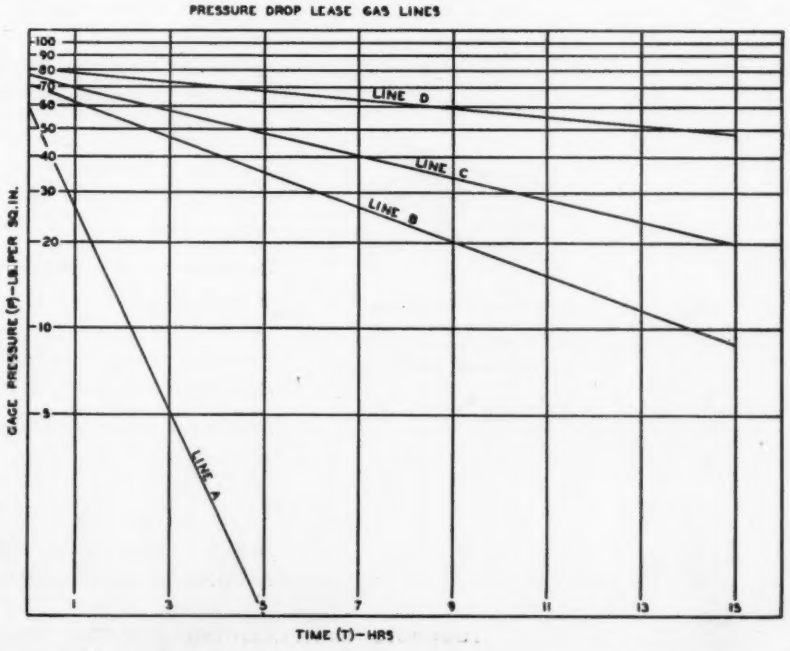
The cost of repairing gas lines to prevent leakage varies widely, according to locality, depth of line, etc. Such work is often done by contractors and if this is the case, contract bids can be obtained for use in making the estimate. The repair costs for the different sections of line in the present example were computed on the basis of 13 cents per foot.

Payout on Repairs

The required number of years to pay out cost of repairs, based on the annual savings from gas leakage, is computed for each section of line. The life of the above lease, on the basis of reserve data, is approximately 7 years. From the column in the table, showing "payout period," it will be noted that financial savings could be effected only on one section of the line (section A, line A in chart) by making repairs.

TABLE 1

Section of line—	Length of line (ft.)	S	Leakage M.c.f./yr.	Loss from gas leakage per year	Est. cost to repair	Required No. years to pay out repairs
A	706	12.3	120.2	$19.22	$92.00	4.8
B	1,075	2.07	31.0	4.96	140.00	28.2
C	723	1.32	13.2	2.11	94.00	44.5
D	2,142	0.502	14.9	2.38	278.00	116.8



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OTHER TEMPERATURE EFFECTS

SEVERAL applications of temperature measurements to problems connected with the drilling and producing of wells have been reported by C. V. Millikan.* In No. 95 and No. 96 of this series, two of such applications have already been discussed in detail. Other applications, the practical utility of which has been proven by Millikan's report, include:

1. Location of gas flow behind casing.
2. Location of gas-bearing strata in high gas-oil ratio wells in order to have a guide for remedial work to properly seal off the gas zone without sealing off oil-bearing strata.
3. Location of thieving formation when circulation is lost in a rotary drilling well.
4. Location of source of water in order to have a basis on which to plug back or use other means to shut off water.
5. Location of casing leaks.

Millikan presented actual well-temperature gradients in his report to show how that certain anomalous readings indicated the various conditions listed above. His curves will not be reproduced, but rather idealized curves showing qualitatively the anomalies that can be expected from the five situations listed above will be given in this and the following installment. References to his curves constructed from actual well tests will be of value for purposes of comparison.

Annular Gas Flows

Suppose that a well is completed to produce oil from some deep horizon and that the production string of casing is cemented up some distance from bottom but not up to the shoe of the next largest and shortest string of casing. Thus an interval of hole is exposed to the open annular space behind the oil string which communicates to the surface. Now suppose further that after the well is placed on production from the lower zone it is noticed that a gas pressure builds up between the two casing strings, and a test of the gas volume available at the braden head shows that it is sufficiently great to warrant taking measures to locate its source so that steps can be taken to properly protect the gas reservoir from flooding by adjacent sands and so that later wells to be drilled can be more intelligently completed. Incomplete log data from the drilling of the well may account for the lack of knowledge concerning the location of the source of the gas. A temperature survey in the well should be of considerable aid in such a situation.

The gas in expanding from the gas-bearing sand into the well bore should produce a cooling effect in that section of hole and possibly raise the temperature above normal in the well above the gas sand. This condition is illustrated by the sketch and temperature gradient (Curve B) shown in Fig. 1. (Curve A represents the normal gradient). The abnormally low temperature at the gas-bearing level would, of course, be expected only during, or shortly after, withdrawal of gas from the braden head at the surface.

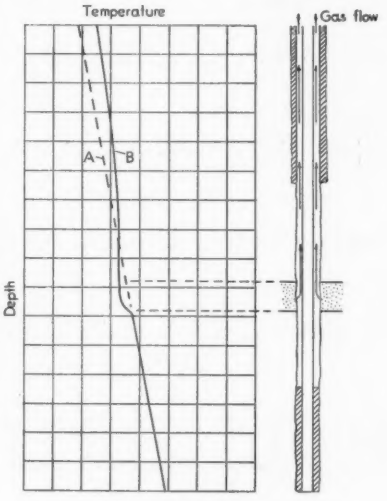

Fig. 1

Locating Gas-Oil Contact

In many oil reservoirs the oil is directly overlain by gas. In completing wells to produce from such a reservoir, extreme care must be exercised in order to produce the oil without producing an excessive quantity of gas. Even when the utmost care is used a well may often be improperly completed and as a result its gas-oil ratio will be too high. In such a case, remedial work is required for the purpose of reducing the amount of gas produced. In order to properly plan and execute such a remedial job, it is imperative that one know, within fairly close limits, the interval from which the excessive gas volume is being produced. The location of this interval is often a major problem.

A temperature survey taken while such a well is producing will often indicate the base of the gas zone by a relatively sharp increase in temperature at this point, since the interval of hole from which the gas is coming would be cooled by the expansion of the gas entering the well while the interval of hole below the gas-oil contact would be relatively warm due to presence of less gas. Such a situation is represented by the simplified sketch and temperature gradient of Fig. 2.

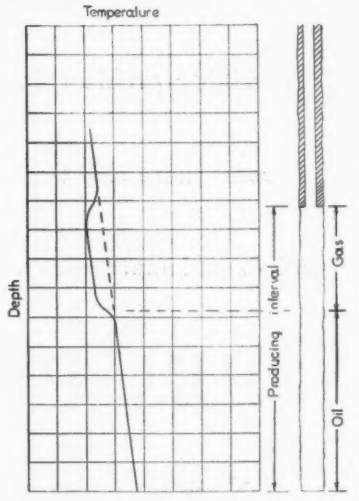

Fig. 2

Sometimes there is not enough expansion of gas to produce an anomaly of the type indicated in Fig. 2. If this is the case, another method may be used for obtaining an indication of the location of the gas-oil contact. This method is based on the premise that the gas-bearing zone will have a higher effective permeability to water than the oil-bearing zone, which is very often true. Thus, cold water placed in the well should enter the gas zone in greater quantities than it enters the oil zone. As a result the temperature of the gas zone will be relatively low, and the desired temperature anomaly may be obtained.

*C. V. Millikan, "Temperature Surveys in Oil Wells," Pet. Dev. and Tech., Vol. 142, 1941, pp. 15-23.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

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Natural Gas

Governor Jones Renews Fight on Big Gas Line

BATON ROUGE, La.—Opposition of Gov. Sam Jones of Louisiana to the proposal of Tennessee Gas & Transmission Co. for a 20-in. gas line to Kentucky was redoubled this week. Governor Jones declared that the company will have a real fight on its hands in its attempt to build the line from southwestern Louisiana fields to Ashland, Ky.

"There won't be any gas line constructed by the Tennessee Gas & Transmission Co. while I am governor of Louisiana," he said.

The governor's renewed pledge of a fight to the finish was inspired by earlier reports from Washington, D. C., that the Federal Power Commission had tentatively agreed to issue a certificate of convenience and necessity. The certificate is dependent, the FPC said, on ability of Tennessee Gas & Transmission to make proper showing at a hearing September 8 in Washington of its financial capacity to build the line, of War Production Board willingness to allocate the required steel and on adequate showing by the company that the necessary supply of gas is available.

Louisiana opposed the project in formal hearings before the FPC, contending that the state's gas supplies were running low and that the area to be served had adequate power resources in coal deposits in the Appalachian fields.

Operators Protest Cayuga And Long Lake Shutdown

AUSTIN, Tex.—Protests against the Railroad Commission order suspending production in the Cayuga and Long Lake fields, pending arrangements to conserve low-pressure gas were filed here last week at the state-wide proration hearing. Operators in the two East Texas fields asked the commission to recall the shutdown order and defer action for at least 15 days. The commission ordered the field shut down July 15.

J. R. Gahan, Houston, representing Tide Water Associated Oil Co. and Seaboard Oil Corp., protested the shutting down of the two pools. He declared that he had the assurance of Lone Star Gas Co. that it would purchase the gas in the areas and that Tide Water requested priorities for the necessary materials to handle the gas. He requested that the fields be allowed to produce while the changeover was being made.

Mr. Gahan was told by Commissioner Culberson that his firms had 6 months in which to make the necessary changes and declared in favor of continuing the shutdown even though he did not sign the original order.

Another operator who protested the shutdown was F. W. Weeks, of Tyler, representing several operators in the area. He asked that a 15-day deferment be allowed in order that Tide Water might have time to make the necessary changes.

Jack Baumel, director of production for the commission, testified that 45 million cubic feet of gas daily was being flared and that 24 million was being taken daily by Lone Star. He said the most efficient ratio would be 2,000-1 and favored the shutting in of the high gas-oil ratio wells and the transferring of the allowable to others.

Steel Allocated for Canadian Gas Line

SASKATOON, Saskatchewan.—A new project for supplying natural gas from the Lloydminster field in western Saskatchewan to North Battleford and intervening communities will be handled by Community Services, Ltd., of Saskatoon, recently incorporated with $3,000,000 capitalization.

Permit has been issued by the Canadian steel controller for 110 miles of standard lap-weld pipe for the project, and it is hoped to complete the line in time to deliver gas this fall.

Utilities Commission Approves Ohio Gas Deal

COLUMBUS, Ohio.—Sale and trade of $1,370,000 worth of gas wells and leaseholds in Ohio between East Ohio Gas Co. and the Ohio Fuel Gas Co., largest gas companies in Ohio, to augment storage facilities to meet war needs was approved last week by the Ohio Public Utilities Commission.

The commission authorized the East Ohio company to pay $484,000 for gas wells and leaseholds in Stark and Summit counties to provide space for summer storage of gas piped in from West Virginia and Texas.

Natural Gasoline

Natural Gasoline Plants Take More Arkansas Gas

EL DORADO, Ark.—The 10 natural gasoline plants operating in Arkansas increased their gas throughput in May to an average of 100,198,000 cu. ft. daily, a rise of 8,943,000 cu. ft., compared to the previous month. During May, the plants averaged daily production of 2,699 bbl. of natural gasoline, 904 bbl. of butane and 34 bbl. of condensate.

Production of sour gas from the oil and condensate fields averaged 103,201,000 cu. ft. daily in May, a slight decrease of 181,000 cu. ft., compared to the average of 103,382,000 cu. ft.

Twenty fields producing sweet gas in the northern part of the state reported output of 11,420,000 cu. ft. daily in May compared to 13,619,000 cu. ft. for April, a decline of 2,199,000 cu. ft.

Recycling

Work to Be Started Soon On Paloma Cycling Plant

LOS ANGELES, Calif.—Plans are under way to start installation of a cyling plant at Paloma, Calif. Authority to proceed with such a unit was received a few weeks ago. This projected unit will serve the members of the Paloma Operators Unit Plan, which was formed by Western Gulf, Texas Co., and Ohio Oil Co.

The present plan allows for the future joining of the unit under certain conditions, but under existing rules an operator must first drill and complete a commercial producing well before becoming eligible to membership.

If future orders require return of natural gas to the reservoir each operator will be obliged to drill a minimum of two wells, one to be used for return of gas to the reservoir. Western Gulf, Texas and Ohio have cut production activities to a minimum and for this reason the field has produced only 589,268 bbl. to date despite the fact the first well was completed in 1939.

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The Oil and Gas Journal

REFINING

Aviation-Fuel Program at Avon Plant Costs $6,365,000

AVON, Calif.—The fourth successive enlargement of the Tide Water Associated Oil Co.'s alkylation plant and other refining facilities here for the manufacture of 100-octane gasoline is progressing rapidly and should be completed by January 1.

When the addition now under construction is completed, the total expenditures will be about $6,365,000 for expansion and improvement of the aviation-gasoline facilities.

Facilities installed by Tide Water Associated at its various refineries since the start of 1940 and used chiefly in producing wartime products represent an investment exceeding $14,000,000, all paid by the company without any financial assistance from the Government.

These pertinent facts concerning Tide Water Associated's refinery activities and expansion projects were disclosed recently by William F. Humphrey, president, in a report to stockholders.

Cumming Authorized to Issue Plant Directives

WASHINGTON, D. C.—Authority to issue operating directives to petroleum refiners has been delegated by Deputy Petroleum Administrator Ralph K. Davies to E. D. Cumming, PAW's director of refining.

The delegation is expected to make for more expeditious operation since any appeal for exception to refinery directives will be handled directly and in the first instance by the refining director.

Text of the memorandum delegating the authority follows:

"Pursuant to the authority contained in Section 7 of Executive Order 9276 as amended by Executive Order 9319, you are hereby authorized to take the following action in your own name as director of refining of the Petroleum Administration for War:

"You may issue to the refiners in the various districts, by telegrams or otherwise, necessary operating directives relating to the extent and character of refinery operations, including without limitation directives as to the permissive amounts of crude to be run and products to be made therefrom under Plan 15 and such other plans, orders, recommendations, directives, or policy determinations as may from time to time be issued by the Petroleum Administration for War."

Premium Reduced on Light Fuel Oil at Wyoming Plants

WASHINGTON, D. C.—Part of the premium on higher gravities of fuel oil was removed last week from the ceiling prices authorized for Wyoming refineries. Ceiling prices for fuel oils of 20 gravity and above were reduced by from 12 to 18 cents per barrel to a uniform level of $1.04 per barrel by the Office of Price Administration in an amendment to the petroleum-price regulation, effective July 20.

In order to produce the required quantity of residual fuel oil in Wyoming, the OPA explained, it is not necessary to blend to a higher gravity than 20. Other fuel oils in Wyoming remain unchanged at 75 cents per barrel for 9.9 gravity and below; 80 cents for 10 to 12.9 gravity; 92 cents for 13 to 15.9, and $1.04 for 16 to 19.9 gravity. Covered by the amended ceiling prices are residual fuel oils and blends thereof with distillate fuel oils, except diesel engine fuels.

Sinclair May Use Toledo Property as Plant Site

TOLEDO, Ohio.—The possibility that Sinclair Refining Co., New York, may build a refinery at Toledo was voiced this week at several oil centers in the northern part of the Middle West. Speculation on future plans of the company in the Toledo area is based chiefly on recent acquisition by Sinclair Refining Co. of waterfront property formerly occupied by the National Malleable & Steel Co.

Sinclair started construction a week ago on a 220-mile pipe line from its East Chicago, Ind., refinery to the Toledo dock site. Possibly the property was acquired exclusively for use as a pipe-line terminal and Great Lakes loading dock.

Recently, Sinclair completed a products line from its refinery at Marcus Hook, Pa., to Steubenville, Ohio, and plans for extension of this facility to Toledo are reported under consideration. With a new line from Toledo to

Steubenville, Sinclair would have direct pipe-line connection between producing properties in the Southwest and its northern and eastern refineries.

If the company decides to build a refinery at Toledo, the project probably would be deferred until the war is finished because of the critical supplies of necessary materials.

There are five refineries now in operation in the Toledo vicinity and some are having difficulty in maintaining crude-oil supplies under existing conditions.

Refinery Margins Fixed At Several Eastern Points

WASHINGTON, D. C.—Maximum prices on bulk lot sales of gasoline by tank-wagon sellers in New Jersey, Pennsylvania, Delaware, Maryland, Virginia and the District of Columbia on quantities of 10,000 gal. or over were established at ½ to ¾ cent per gallon under full tank-wagon ceilings by the Office of Price Administration last week. Tank-wagon sellers include both refiners and resellers.

Full tank-wagon prices are now being charged in these states by most sellers regardless of the size of deliveries, OPA said. To restore the custom of allowing differentials, OPA stipulates that on and after August 1, 1943, maximum prices on 10,000 to 60,000 gal. sales must be ½ cent per gallon under tank-wagon price while on sales of 60,000 gal. or more a discount must be made of ¾ cent per gallon.

During the 60 days prior to October 15, 1941—the base period used for petroleum prices—studies by OPA in the above states and the District of Columbia showed that a considerable proportion of bulk consumers were paying prices considerably below the consumer tank-wagon price. Certain large consumers were paying as much as 1¾ cents below the tank-wagon level.

The action, making the differentials specific, is contained in Amendment 117 to Revised Price Schedule 88, effective August 1, 1943.

The same amendment provides that on single lot tank-wagon deliveries of less than 250 gal. a surcharge of 1 cent per gallon may be added to the price applying for single lot deliveries of 250 gal. or more.

The amendment also spelled out differentials for large quantity bulk lot sales by sellers in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut and New York. No changes from existing practices are made in this area, and the amendment puts into effect the same differentials observed during the 60 days prior to October 15, 1941.

Sketches of Plant Operators

THE appointment of F. M. (Jerry) Simpson of Bartlesville as general superintendent of the Refining Division of Cities Service Oil Co. (Del.) was announced last week by H. W. Camp, manager of the refining division. Mr. Simpson, who has been with Cities Service the past 20 years, succeeds W. W. Scheumann, who is now associated with Cities Service Refining Corp. In his new position, Mr. Simpson will supervise operations at Cities Service Oil Co.'s refineries at East Chicago, Ind., and Ponca City, Okla.

Born in southeastern Texas, Mr. Simpson spent most of his early life in the vicinity of Houston, Tex. His summer vacations were spent in fishing and working for various oil companies on the Houston Ship Channel.

After graduating from Texas A. & M. College with a bachelor of science degree in mechanical engineering, Mr. Simpson became a junior engineer for a predecessor company to Cities Service Oil Co. As such, he completed assignments in the refining, natural gasoline and motor-transportation divisions, before taking a permanent position with the company's refining division.

He worked at the Ponca City refinery for 2 years before joining the headquarters staff of the refining division, then located at Tulsa. After 14 years in the Tulsa headquarters offices, he moved to Bartlesville in 1940 when the division offices were transferred there.

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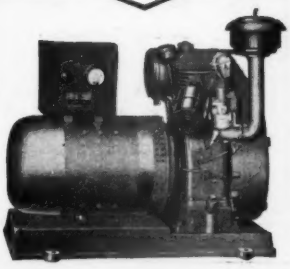

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PIPE LINES

Deliveries Off Slightly Through Eastern Lines

Deliveries of crude oil through eight eastern pipe lines formerly in the Standard Oil Co. group decreased slightly in the first 6 months of 1943 from the corresponding period a year ago. Deliveries in June totaled 28,483,000 bbl., a reduction of nearly 2 per cent from the volume of 29,039,000 bbl. handled in the same 1942 month.

Deliveries in the first half of 1943 totaled 164,058,000 bbl., against 164,778,000 bbl. in the corresponding 1942 period.

Most of the decline can be charged to the continued reduction of crude-oil production in the Appalachian area. Eastern pipe-line traffic during the past 2 years has been abnormally high because of increasing overland movement of crude.

The accompanying table shows deliveries through the eight lines for June and the first 6 months of 1943, with the comparisons for similar 1942 periods.

EASTERN PIPE-LINE DELIVERIES
(Thousands of barrels)

	June		First half	
	1943	1942	1943	1942
Buckeye	11,932	13,433	68,244	73,660
Eureka	1,093	1,036	6,271	5,719
Nat. Transit	1,903	1,701	10,973	10,089
N. Y. Transit	1,095	1,095	6,544	6,319
Northern	1,710	1,594	10,200	8,724
Ohio Oil	8,341	8,143	48,459	48,408
Southern	947	784	5,268	4,511
S. W. Penn	1,462	1,253	8,099	7,348
Total	28,483	29,039	164,058	164,778

United States Financing Northern Canadian Line

OTTAWA, Ont.—Prime Minister Mackenzie King has informed the House of Commons that, under an agreement, the text of which cannot yet be revealed for security reasons, the United States is bearing the initial cost of the oil pipe line from the Fort Norman oil field, in the Northwest Territories, to White Horse, in the Yukon Territory.

Canada has granted the right-of-way and is securing the sites required in addition to facilitating the entry into the dominion of labor and equipment required for the project. Canada also waives royalties on the oil produced for the duration of the war.

The United States will retain ownership of the pipe line until the end of the war, when it will be offered for sale, with the Canadian Government having the first right to purchase. If the amount involved cannot otherwise be satisfactorily established, reference will be made to the Joint Defense Board. Title to the land involved will be retained by the dominion.

Magnolia May Lay 12-in. Line From West Texas

An increase of 42,000 bbl. in the daily pipe-line outlets for West Texas crude is proposed by Magnolia Pipe Line Co., which has filed application with the Petroleum Administrator for War for authority to build a 12-in. line paralleling its present 8-in. system from Midland to Corsicana, Tex.

Oil producers attending the statewide proration hearing at Austin, Tex., last Friday unanimously adopted a resolution urging immediate approval of the Magnolia line by WPB. In the resolution urging the granting of materials, the producers and operators telegraphed PAW and WPB that the line was a proper, desirable and helpful effort to supply an urgent war demand and solve a transportation bottleneck.

The resolution was drafted by H. P. Nichols, of Tyler, executive vice president of the East Texas Oil Association, upon the suggestion of Beauford Jester, chairman of the Railroad Commission.

The proposed line would be 394 miles long and would be equipped with three pump stations in order to handle the proposed capacity of 42,000 bbl. daily. The line would tie into Magnolia's main system extending from the Mid-Continent to Magnolia Petroleum Co.'s main refinery at Beaumont, Tex.

Approximately 6 to 8 months would be required to build the Magnolia line, according to preliminary information issued at Austin, Tex., last week by Beauford Jester, chairman of the Railroad Commission.

From the junction with its main line near Corsicana, the Magnolia line could be used either for moving all or part of the proposed new line's capacity north into Mid-Continent refining centers or make delivery to the Gulf Coast and intermittent points.

Already approved for construction starting later this year is Stanolind Pipe Line Co.'s 16-in. crude-oil line from Sundown, Tex., in the Slaughter field, to Drumright, Okla., a system which will provide an outlet for 54,000 bbl. of crude daily with only one pump station. If pumping capacity is added, the 16-in. line could, of course, handle considerably larger volumes.

Humble Laying Old Atlas Pipe in South Texas Fields

HOUSTON, Tex.—Humble Oil & Refining Co. is preparing to lay 10 miles of 8-in. gas line from the South Anahuac field, Chambers County, Texas, to connect with its gas system from the Tomball field. Pipe for the project is to be taken from the 8-in. line recently acquired from Atlas Oil & Refining Co., between Longview, Tex., and Shreveport, La.

Another 15 miles of the old Atlas line will be used in a gas project between Humble's Baytown, Tex., refinery and the Dickinson field.

Remainder of the Atlas line will be used in connecting the Humble company's new production in the Hall Bayou field, Brazoria County, to existing transportation facilities.

Humble Proposes Line to Deep Barnhart Field

Humble Pipe Line Co. is reported to be contemplating a 14-mile 4-in. outlet to the Barnhart-Ellenburger pool in extreme southeastern Regan County, Texas. This pool has been without an outlet since its discovery September 1, 1941. The proposed line would connect to the Kemper station, which is on Humble's line serving the Yates pool and running to Ingleside. There are 21 wells producing in the 9,100-ft. horizon at Barnhart.

More Tank Cars Released For East Coast Service

WASHINGTON, D. C.—More than 300 tank cars have been released for East Coast service by 14 railroads as a result of a cooperative oil industry-railroad-PAW fuel oil distribution program in the Southwest.

The release of the tank cars was accomplished, despite the fact that the railroads were confronted not only with a critical shortage of residual fuel oil for their own use but also with an actual shortage of tank cars.

Southwestern railroads burn approximately 5,000,000 bbl. of fuel oil a month. In other sections of the country, most of the railroad locomotives are coal burners.

The railroads faced a shortage of both tank cars and fuel oil to meet their own needs last fall, when PAW requested that shipments from the Midwest to the East be increased.

Action taken by the industry-PAW committee to meet the railroads' fuel-oil requirements included:

(1) Elimination of crosshauling; (2) establishing zone areas and scheduling oil shipments from the nearest sources of supply; and (3) eliminating the common practice of using tank cars as storage tanks and encouraging the railroads to build adequate stationary storage tanks at strategic points.

First of 100 New Tugboats Finished for Oil Service

WASHINGTON, D. C.—The first of 100 new tugboats to be used in petroleum transportation is en route from Boston to the Gulf Coast to take on its first load, the Office of Defense Transportation announced last week in a progress report on the nation's barge, towboat and tugboat construction program, costing $75,000,000.

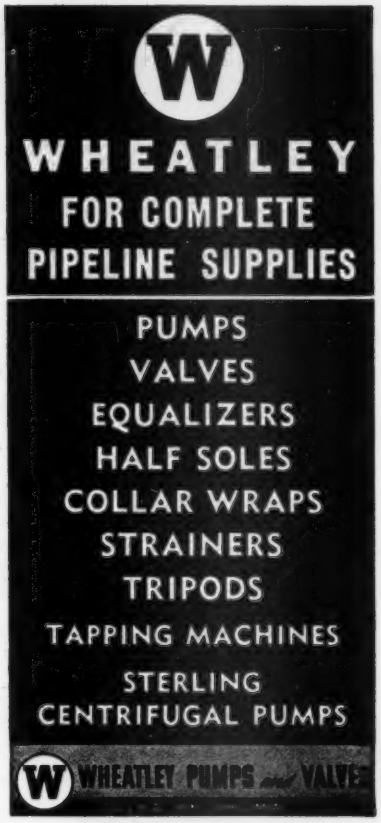
The tug will haul three petroleum barges from a Gulf refinery to Panama City, Fla., for movement across the state to Jacksonville by rail and distribution along the Atlantic Coast by barge.

In addition to the 100 tugboats, each of 600 hp., and terminal facilities the program calls for the construction of 305 wooden and composite (wood and steel) tank barges, capacity 6,000 bbl. each; 168 all-steel tank barges, capacity 9,520 bbl. each, and 21 river towboats, 2,000 hp. Under a companion program, 116 steel dry-cargo barges are being converted to petroleum carriers.

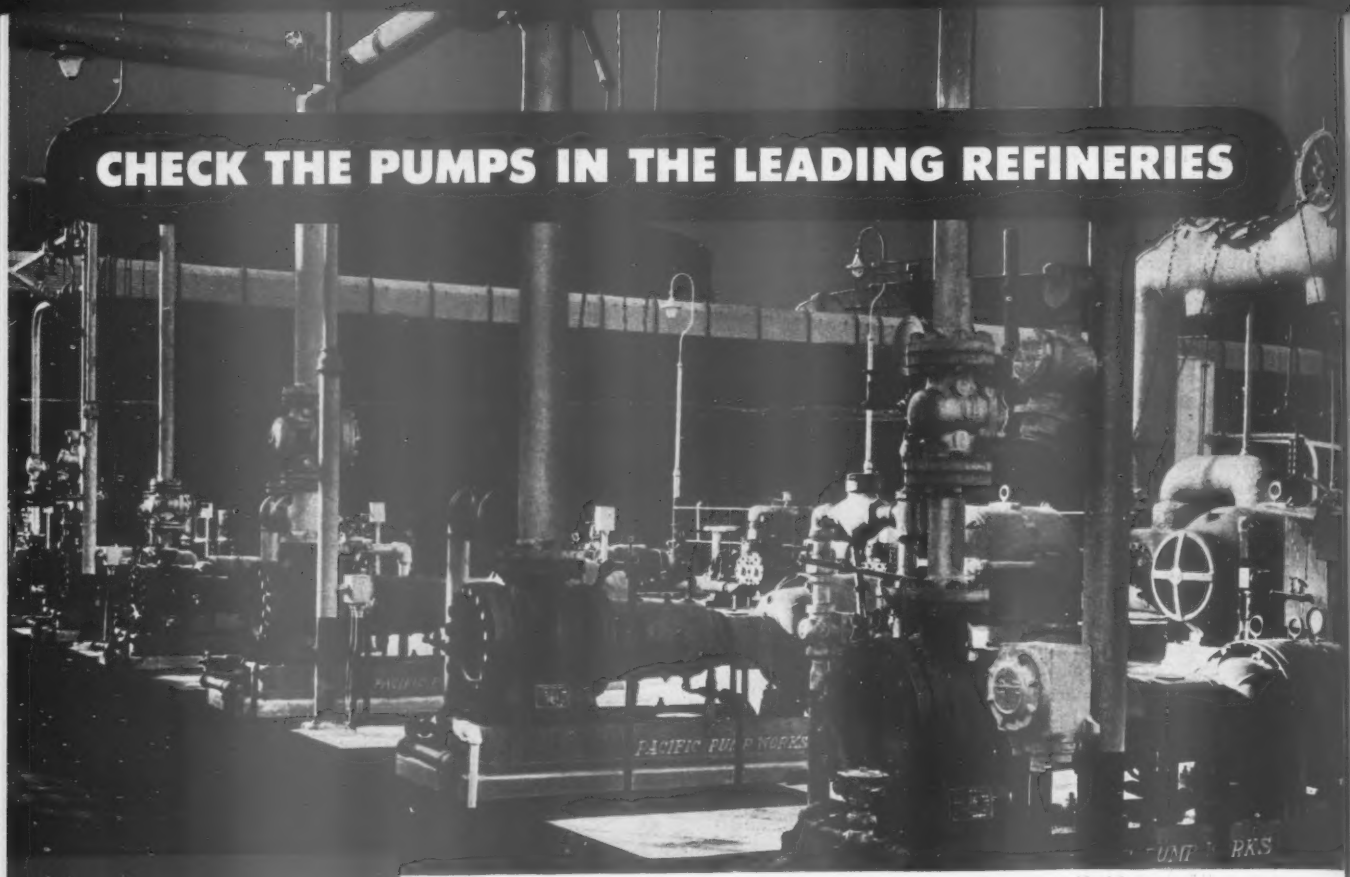
As more new units are completed and put into operation, they will increase the flow of petroleum and petroleum products to the East until, on completion of the entire program, the waterway movement will have been increased approximately 100,000 bbl. a day.

The effect of new equipment already added, plus more efficient use of available capacity, is indicated by the following table, which shows oil movements by water in May 1943 as compared with April 1942:

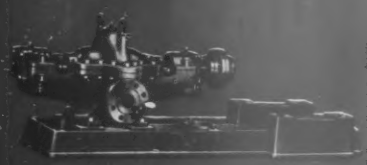
	Bbl./day	
	April '42	May '43
Gulf Intracoastal Canal, Texas points to New Orleans	106,530	244,681
East from New Orleans along Intracoastal Canal	49,803	63,297
North from New Orleans on the Mississippi River	65,002	102,339
North from Baton Rouge on the Mississippi River	43,507	73,175
Oil passing Cairo, Ill., on Mississippi-Ohio rivers	53,787	111,121
Oil passing Mount Vernon, Ind., on the Ohio River	47,146	80,011
Oil passing Cincinnati, Ohio, on the Ohio River	38,507	52,699



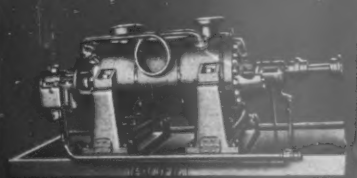
CHECK THE PUMPS IN THE LEADING REFINERIES



Type SV—Vertical Split Single Stage, Top Suction and Discharge Pump



Type K—Horizontal Split Single Stage, Double Suction Pump



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Exploration and Drilling

Week's Highlights

RECENTLY we have seen suggestions that discoverers of new fields be granted either a higher price or a higher allowable. The first suggestion came from OPA and has run into considerable opposition on the part of the oil industry. It is indeed hard to visualize a purchaser of crude willingly paying a higher price for nice, fresh, newly discovered oil from the Swamp Hollow field than for that old stale stuff from East Texas or Oklahoma City. When the availability of transportation facilities from the old fields is considered, the solution becomes even more difficult. The only remaining purchaser would be the Government. That the Government should pay a bonus for oil from new fields would not be without precedent. It is now paying a good-sized bonus for newly mined silver, thanks to the efforts of the silver bloc. That an "oil bloc" would demand a higher price for newly found crude is hard to imagine. If there were such a bloc it would probably demand a general price increase instead.

The higher allowable granted to discoverers of oil is of assistance only when the oil can be sold. That is, it is effective mainly in the case of successful wildcatting near existing fields. This does not add greatly to the nation's reserves.

It appears to some observers that the oil industry has not yet made its appeal to Washington for further consideration on a sound basis. Most of its efforts, outside of PIWC, have been confined to testifying before congressional committees, which almost invariably go back to Washington and recommend a price increase. The plea for a price increase is generally based on (1) the necessity of assisting the wildcatter, (2) the necessity of assisting the stripper-well operator and (3) increased production costs.

Some time ago, many were criticized for spreading the idea that production could be increased by opening valves. The statement was perfectly correct when made and production has been increased, mainly by this method, for over 18 months. With the exception of West Texas, there are few more valves to turn in order to get more production.

The great majority of oil wells in the United States are producing less oil today than they did at the time of Pearl Harbor. Their costs are higher than at that time. It does not matter whether these wells are on stripper properties or whether they are pumping 50 or 100 bbl. daily, this fact is true. Instead of calling attention to the plight of the stripper operator, the industry would appear to be better advised to point out that in practically every area the only way to maintain present production is to continue to drain the good fields too rapidly and speed up the time when all wells will be stripper wells.

Nor is the wildcatter separate from the rest of the industry. There is no reason to doubt that an increase in the price of crude would spur him to greater activity but that need not mean more discoveries. If the industry holds out the promise that an increased price means a rise in the nation's reserves, the argument may boomerang if the large discoveries are not forthcoming.

The fact and figures are available to show that the old established laws of supply and demand warrant a general price increase, not for the sake of any group of operators but for the sake of the whole industry. The demand, at present prices is too great for the existing supply. An increase in price may reduce the demand or it may result in an increase in supply, or both. No thinking about new and improved methods of getting around this economic law is necessary. The facts are doing all the talking that is needed.

COMPLETIONS IN ALL FIELDS . . .

(Week ended July 17, 1943)

	Oil	Gas	Dry	Total	Footage	Total comp. to date 1943	1942
N. Y., Penna., W. Va.	51	18	5	74	144,495	1,704	1,898
Ohio	5	5	8	18	50,332	419	557
Indiana	2	0	1	3	5,556	122	178
Kentucky	4	1	2	7	16,084	184	118
Illinois	20	1	11	32	78,186	865	863
Michigan	2	0	3	5	14,056	253	367
Kansas	16	0	12	28	96,262	796	804
Nebraska	0	0	2	2	7,349	16	22
Missouri-Iowa	0	0	0	0	0	7	9
Oklahoma	13	0	11	24	63,983	574	694
Texas:							
North Central Texas	18	0	27	45	97,951	656	635
West Texas	15	0	1	16	63,524	428	858
Texas Panhandle	2	0	1	3	9,024	91	220
Eastern Texas	0	0	2	2	15,659	138	214
Texas Gulf Coast	4	0	3	7	47,709	216	418
Southwest Texas	11	1	7	19	90,975	453	677
Total Texas	50	1	41	92	324,842	1,982	3,022
North Louisiana	2	0	3	5	17,820	157	257
Louisiana Gulf Coast	5	0	3	8	69,739	181	284
Total Louisiana	7	0	6	13	87,559	338	541
Arkansas	2	0	3	5	19,478	125	81
Mississippi and Southeast	0	0	2	2	6,733	48	30
Montana	5	0	3	8	16,293	103	86
Wyoming	3	0	1	4	14,409	58	51
Colorado, Utah	0	0	0	0	0	6	9
New Mexico	4	0	0	4	14,902	110	133
California	12	1	1	14	43,955	639	415
Total United States	196	27	112	335	1,004,474	8,349	9,878
Total previous week	190	28	116	334			
Week ended July 18, 1942	170	39	96	305			

ROCKY MOUNTAIN AREA

Tensleep Is Objective of Little Buffalo Basin Tests

DENVER, Colo. — Little Buffalo Basin, on the west side of the Big Horn basin in northern Wyoming, which has been producing gas from the Frontier formation since 1914, is scheduled for one and possibly two deep tests to the Tensleep horizon at an early date. The outcome will be watched with keen interest inasmuch as several factors place it in the same category as the Elk Basin field, which has developed into the major operation in the Rocky Mountain area since Minnelusa Oil Corp. brought in the Tensleep discovery last winter. The structure, which consists of two elliptical domes with no surface indications of faulting, is located principally in Park County, 60 miles south of the Elk Basin field, and 20 miles south of the Oregon Basin field. Gas was discovered in SE NW 2-47n-100w in 1914, in the Frontier formation at 1,750-92 ft., and since then up to 1938 only nine wells were completed with an estimated potential capacity of 100,000,000 cu. ft. a day. In 1939 two of the old wells were deepened, but with this exception, no development has taken place for the past 15 years. The deepest test was drilled on the extreme southeast flank of the east dome in the SE SE 7-47-99 by Texas Co., which had a small show of light oil in the Dakota at 3,398 ft. and was abandoned at 3,475 ft. The productive area in the Frontier is approximately 4,800 acres. Stanolind Oil & Gas Co. and Ohio Oil Co. control most of the acreage, with some state and federal leases being held by T. A. Pedley, of Denver, and McGrath Royalties Co. The field was unitized for the gas area in the Frontier in 1931.

A unitization plan for the deep sands has been approved by the secretary of the interior and is now being signed. In anticipation of a condition similar to that found at Elk Basin, in which the Tensleep extended far out beyond the limits of the old developed area in the shallow sands, the new unit embraces 17,660 acres, or four times the area of the gas horizon. It is reported, however, that the state land leases in the field have not yet been placed in the unit, the land board being desirous of obtaining better prices for its share of oil than has heretofore prevailed in the black oil fields in that area, and unwilling to participate until the matter is settled. The board and the lessees are said to be prepared to drill a test independent of the unit if necessary. Also, it is reported that some of the lessees of federal land already have entered into a deal with Fred Goodstein, of Casper, Wyo., to drill an independent test. The first test to the Tensleep, should it come in as a producer, will be classed as a discovery of a new deposit under recently enacted federal leasing laws, and as such will carry the flat 12½ per cent royalty. The first well also will establish the drilling pattern for the field, and as a consequence of the situation it is expected that competition will develop as to which of the several interests will be first to determine the possibilities of the deeper horizon.

DAILY AVERAGE PRODUCTION FOR WEEK

	July 17 crude oil	July PAW quota all oils	July 10 crude oil
Arkansas	77,200	77,200	76,800
California	780,150	827,000	778,750
Colorado	6,050	7,000	6,100
Eastern fields	96,975	113,100	100,550
Illinois	219,800	233,000	220,700
Indiana	13,750	14,500	13,800
Kansas	293,700	300,000	280,150
Louisiana	349,250	331,300	349,100
North Louisiana	*85,250*	.....	*85,100*
Louisiana Gulf Coast	*264,000*	.....	*264,000*
Michigan	55,880	60,100	55,600
Mississippi	50,850	50,000	51,200
Montana	21,555	21,800	22,025
Nebraska	2,100	2,200	2,150
New Mexico	100,200	105,700	100,050
Oklahoma	330,650	361,400	335,050
Texas	1,615,600	1,727,000	1,615,600
East Texas	*371,000*	.....	*371,000*
West Texas	*245,600*	.....	*245,600*
North Central Texas	*137,700*	.....	*137,700*
East Central Texas	*128,000*	.....	*128,000*
Texas Panhandle	*90,400*	.....	*90,400*
Texas Gulf Coast	*559,900*	.....	*559,900*
Southwest Texas	*83,000*	.....	*83,000*
Wyoming	97,605	97,200	92,070
Total United States	4,111,315	4,328,500	4,099,695

Total production Jan. 1-July 17, 1943 ..... 778,760,485 bbl.
Same period last year ..... 747,874,780 bbl.

WYOMING COMPLETIONS

Brenning Basin, Converse County: Ohio Oil Co. 1 Boot I & L, NE SE NE 11-32n-73w, T.D. 3,030 ft., top of Dakota, 3,005 ft., plugged and abandoned.

Byron, Big Horn County: Ohio Oil Co. 1 Anderson, Lot 3, 25-56n-97w, T.D. 5,495 ft., 6-in. 5,344 ft., 300 bbl. per day from the Tensleep.

Maverick Springs, Fremont County: Continental Oil Co. 18 Chatterton, NW SE NW 15-6n-2w, T.D. 1,724 ft., swabbed 60 bbl. oil and 168 bbl. water in 24-hr. test.

Oregon Basin, Park County: Yale Petroleum Corp. 4-A Frisby, NE SE NW 32-52n-100w, T.D. 4,160 ft., 7-in. on bottom, top Embar 3,195 ft., top Tensleep 3.750 ft., flowed 250 bbl. per day through perforated casing, beaned down.

MONTANA COMPLETIONS

Aloe district, Toole County: Northern Ordnance, Inc., 1 Barkulo, NW NW 26-34n-3w, top Madison 1,619 ft., dry at 1,715 ft.

Cut Bank, Glacier County: Santa Rita Oil & Gas Co. 2 State, SW SE 12-33n-6w, T.D. 3,094 ft., no 7-in., upper Cut Bank 3,025-86 ft., show of oil at 3,052 ft., no lower Cut Bank, testing.

Texas Co. 6 Government, SW NE SE 18-32n-5w, T.D. 2,729 ft., 7-in. 2,680 ft., Cut Bank 2,660-2,726 ft., main pay 2,715-26 ft., swabbed 63 bbl. first 24 hr. Cleaning out and testing.

Kevin-Sunburst, Toole County: Texas Co. 9 Reeg, NE SW SW 14-35n-2w, T.D. 1,507 ft., Ellis-Madison 1,501-7 ft., acid, 85 bbl. per day, no water.

Casper T. Oien 14-A Engemoen, NW SE NW, 14-35n-2w, T.D. 1,552 ft., Ellis-Madison 1,537-42 ft., acid, 111 bbl. per day.

Kalbar Oil Co. 3 fee, NE NE NE 13-35n-2w, acid, dry at 1,625 ft.

Rimrock Oil Co. 10 Schmidt, SE NE NW 29-35n-3w, T.D. 1,796 ft., Ellis-Madison 1,785-96 ft., acid, 10 bbl. per day.

Sweetgrass district, Toole County: Northern Ordnance, Inc., 1 Holtze, E½ NE NE 23-37n-2w, top Madison 2,231 ft., dry at 2,275 ft.

Southwest Colorado.—The area in which the Barker dome (see above) is located is attracting considerable attention and includes not only southwestern Colorado, but northwestern New Mexico and northeastern Arizona. Stanolind Oil & Gas Co., Atlantic Refining Co., Amerada Petroleum Co., and Plymouth Oil Co. have been making extensive geophysical surveys of that area within the past 2 years, some of which were renewed this spring. It takes in the territory as far south as the Walker dome, in McKinley County, where the Plymouth company is reported preparing to drill a deep test, and to Rio Arriba County, on the east. The Ute Indian Council is expected to take action at its next meeting looking to the advertising of leases on acreage to the north and west of the Barker tract bid in by the Southern Union Producing Co. Principal wildcats in the area are mentioned below.

Arizona.—Argo Oil Corp. 1 State, C NE NE 22-15n-29e, Zuni structure, Apache County, northeastern Arizona, joint with Midwest Oil and Mountain Producers, has spudded in for a deep test to the Pennsylvanian. Structure lies due west of the Rattlesnake pool

June Completions Are Up 10 Per Cent

THE number of completed wells continued its upward climb, showing an increase of nearly 10 per cent over the previous month and 13.8 per cent over the same period in 1932. Year-ago totals were: 1,309 completions comprising 726 oil wells, 157 gas wells and 426 dry holes. The number of active drilling wells show the first drop, compared with the previous month, since the first of the year. Last year drilling wells numbered 2,386.

Gains in completions are noted in the Appalachian, Kentucky, Michigan, Illinois, Oklahoma and California areas, while all of Texas with the exception of the Gulf Coast showed fewer wells drilled during June.

SUMMARY OF OPERATIONS, JUNE 1943

	Comp.	Oil	Prod.	Gas	Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Rigs and drilling
Appalachian	*275	188	388	65	22	2	230	35	8	0	545,915	339
Ohio	84	11	677	36	37	14	35	35	0	0	196,229	183
Indiana	13	4	294	0	9	2	8	3	0	0	31,720	36
Kentucky	46	12	1,567	20	14	2	16	28	0	0	110,874	121
Michigan	70	22	3,666	10	38	0	38	32	0	0	166,428	118
Illinois	136	71	8,953	1	64	5	51	80	0	0	347,602	170
Kansas	160	89	25,420	1	70	0	12	145	3	0	550,254	229
Nebraska	2	1	10	0	1	0	0	2	0	0	6,608	2
Missouri and Iowa	2	0	0	0	2	1	1	0	0	0	2,509	1
Oklahoma	103	57	7,258	8	38	7	32	25	38	1	407,573	272
North Texas	71	23	4,146	1	47	8	28	28	7	0	196,454	58
West Central Texas	23	9	1,731	0	14	5	8	8	2	0	58,323	21
West Texas	62	42	35,532	1	19	1	7	26	28	0	292,706	68
Texas Panhandle	12	10	1,351	1	1	0	0	12	0	0	37,670	14
East Texas	29	13	5,917	0	16	0	1	14	14	0	145,778	23
Upper Gulf Coast	42	22	6,911	1	19	1	0	1	34	6	377,002	80
Lower Gulf Coast	34	19	2,331	0	15	0	0	3	31	0	211,791	79
South Central Texas	7	2	311	0	5	2	1	2	2	0	23,659	10
South Texas	30	7	896	0	23	0	8	16	6	0	114,691	70
Southeast New Mexico	16	14	2,875	0	2	0	0	15	1	0	59,815	34
Arkansas	25	14	1,631	1	10	0	2	13	10	0	118,509	46
North Louisiana	30	11	267	4	15	1	11	8	10	0	108,027	50
Louisiana Gulf	35	18	4,162	2	15	1	5	2	15	12	276,420	89
Mississippi	15	3	993	0	12	0	4	9	2	0	62,952	18
Montana	20	12	2,606	3	5	0	11	9	0	0	43,380	85
Wyoming	4	3	1,492	0	1	0	0	3	1	0	18,890	85
Colorado, Utah	1	1	25	0	0	1	0	0	0	0	660	21
Northwest New Mexico	1	0	0	1	0	0	1	0	0	0	1,890	13
California	141	118	15,657	2	21	7	47	73	12	2	436,149	144
Alabama	1	0	0	0	1	0	0	1	0	0	1,856	2
Total June	1,490	796	137,067	158	536	60	557	628	224	21	4,951,884	2,481
Total May	1,358	720	154,115	139	499	57	449	594	236	22	4,632,388	2,522
Difference	132	76	17,048	19	37	3	108	34	12	1	319,496	41

*Does not include 146 input wells.

on the New Mexico side.

Canyon Creek. — Weststates Petroleum Corp., of Long Beach, will drill a second test on the Canyon Creek structure, Sweetwater County, Wyoming, 6 miles west of the Hiawatha field, which will explore the Tertiary beds. Location has not yet been released, but it will be near a unit test drilled in 10-12n-101w in 1941, which was completed in a sand in the Wasatch at 2,790 ft., after plugging back from 3,900 ft., for 1,500,000 cu. ft. of gas per day.

Iles.—A plan for the unitizing of the Iles field, Moffat County, Colorado, is reported being submitted to lease and royalty owners. It is the largest producing field in Colorado, running in excess of 500,000 bbl. annually, the production coming from the Morrison and Sundance sands at 3,500 ft. This action is believed preliminary to the drilling of a deep test to the Pennsylvanian, which has never been explored. The contract under which one of the government leases is operated called for test below the Sundance, but the owner of the lease extended the provision several times, due to the upper sands yielding sufficient production for the market needs. Now, however, there is a demand for the crude, and new federal regulations reducing royalties on the discovery of new deposits to 12½ per cent for a period of 10 years, is said to make the time opportune to find out what may be found below the present pay. Stanolind Oil & Gas Co. and Texas Co. are principal operators, with several independents holding leases outside the present productive area.

Blacktail test.—A. B. Cobb & Co. 1 Allotted-223, NW NW 4-29n-8w, on Blacktail structure, Pondera County, Montana, which cored saturated lime in the top of the Madison at 5,114-22 ft., set the 7-in. at 5,110 ft., and when plug was drilled, it showed 2,000 ft. of sulfur water. It was then cored at 5,122-27 ft., showing some saturation in thin streaks. It will try to shut off water and make a test.

Elk Basin.—Outposts in the Elk Basin field which are at critical depths continue to show favorable results. Yale Oil Corp. 1 Watson, NE SE 36-58-100, which had 5,000 ft. of oil in the upper Tensleep at 5,487 ft., total depth, cemented pipe on bottom, in the break between the upper and lower benches, decided to go on down before completing, and found the lower bench saturated. Total depth is 5,570 ft. It has cored 60 ft. of saturation below the pipe and found no water. This is a key well on the southwestern side of the field Stanolind Oil & Gas Co. 1 Dengler, SW NE 35-9s-23, at the north end, on the Montana side, is drilling and coring below 5,520 ft. in sand, 76 ft. below the top, and last cores recovered continued to show saturation. Minnelusa Oil Corp. 1 Zimmerman, three-fourths of a mile southwest of 1 Dengler, topped the Tensleep at 4,919 ft., and is coring in saturated sand below 5,010 ft. MacKinnie's 2 Northern Pacific, at the south end of the field, which flowed at the rate of 187 bbl. an hour, as reported last week, will not be drilled deeper and will be given official test in the next few days.

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NORTH CENTRAL TEXAS

Mississippi Lime Production Found Between Joy and Buffalo Springs

WICHITA FALLS, Tex. — Midway between the Joy-Mississippi lime pool and the new Buffalo Springs pool recently opened by Continental Oil and Omohundro 1 Stephens, L. T. Burns appears to have opened a new Mississippi lime pool at his 1 Joe P. Thompson, Block 29, Webb subdivision of San Augustine County School Land. On drill-stem test from 5,972-6,044 ft. the well flowed at the rate of 100 bbl. per hour, and was shut down to run 7-in. casing to 6,020 ft. After plug was drilled, the well flowed an estimated 50 bbl. fluid per hour, with no water, but considerable drilling mud. Two good wells were completed in the Joy pool. L. T Burns 1 Lumpkin flowed at the rate of 1,008 bbl. per day, and Shell Oil 3 T. H. Brock, Lot 31, H. Williams Survey, flowed at the rate of 1,552 bbl. per day. Rig was being moved back on Tom B. Owens 1 Blakeley, Block 79, Freestone County School Land Survey, to carry it down to 7,000 ft. It was reported dry and abandoned last week at 6,110 ft.

Cooke County.—A new Strawn sand pool was opened when Snuggs, Seitz & McElreath 1 Percy McGeorge, Block 64, Fannin County School Land Survey, 1 mile south of the Winger sand part of the Walnut Bend pool was completed for 236 bbl. per day on pump from perforations in casing at 4,286-4,302 ft. The well had been drilled through the Winger and Simpson sands to total depth 6,110 ft.

Montague County.—R. H. Dearing & Sons 1 Field, Field Survey, eastern part of county, was drilling below 6,555 ft. in shale. W. B. Omohundro 1 Mose Fowler, R. M. Davis Survey southeast of Ringgold, was drilling below 6,150 ft. after topping Cado lime at 6,055 ft.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: L. T. Burns 1 J. B. Frerich, 1,000 ft. from W, 1,500 ft. from S, Lot 106, Clark & Plumb subd., Blk. 4, 5,800-ft. rotary test.

C. W. and W. M. Snoddy 1 J. J. Perkins, 150 ft. from N, 150 ft. from E of S 100 ac. of W½ Sec. 9, Blk. 3, H.&T.C. R.R. Sur., 1,800-ft. rotary test.

Akin & Dimock 1-B C. L. Abercrombie, 330 ft. from N, 990 ft. from E, Blk. 25, Harris subd., dry, T.D. 1,567 ft.

Akin & Dimock 1-C C. L. Abercrombie, 1,980 ft. from E, 1,320 ft. from S, Blk. 23, Harris subd., dry, T.D. 1,486 ft.

Shappel Oil 1 Virgil Seay, 1,493 ft. from S, 1,542 ft. from W, Blk. 107, Harris subd., dry, T.D. 1,400 ft.

W. C. Young 1 J. T. Richardson, 237 ft. from N and W, W. McCune Sur., pump 10 bbl., pay sand 1,187 ft., T.D. 1,195 ft. Discovery.

W. C. Young 1 S. S. Hayter, Sec. 2436, T.E.&L. Sur., dry, T.D. 1,420 ft.

Baylor County: Jack Story 1 W. H. Portwood, 1,233 ft. from W, 150 ft. from S Sec. 3138, T.E.&L. Sur., 6 mi. SE Megargel.

Cooke County: T. L. Wheeler 1 Emil Vogel, 330 ft. from NW, 330 ft. from NE line 170.8-ac. tract, T. H. Conley Sur., 2 mi. SW of Muenster.

D. L. Monroe et al 1 John McIntosh, 328 ft. from N, 330 ft. from W, Sec. 5, S.P. R.R. Sur., dry, T.D. 1,606 ft.

Pace Pet. 1 J. G. Cannon, 330 ft. from S and W, J. F. Johns Sur., dry, T.D. 2,202 ft.

Snuggs, Seitz & McElreath 1 Percy McGeorge, 1,386 ft. from S, 1,319 ft. from W, Lot 64, Fannin County School Land, pump 236 bbl., sand pay 4,286 ft., perf. 71 shots, 4,286-4,301 ft., T.D. 6,10 ft. Discovery.

Texas Co. 1 C. D. Meador, 3,150 ft. from W, 1,800 ft. from N Henry S. Dixon Sur., 4½ mi. NW of Muenster.

Tarrant County: C. Andrade III 1 R. B. Sharpless, 737.5 ft. from N and E, S. H. Thompson Sur., 5 mi. W of Grapevine, 8,500-ft. rotary test.

Wichita County: Consolidated Oil 1 Alex Davidson, 495 ft. from N, 1,815 ft. from E lines of W 640 ac J. McDowell Sur., 3 mi. SW Wichita Falls, 5,500-ft. rotary test.

W. T. Waggoner, est. 1 "NN" Waggoner, 200 ft. S, 2,100 ft. E of SE cor. Sec. 34, Blk. 5, H.&T.C. Sur., but in A. Gibson Sur., 3,800-ft. test.

Wilbarger County: W. T. Waggoner, est. 1 "MM" Waggoner, 660 ft. from N and E, Sec. 8, Blk. 17, H.&T.C.R.R. Sur.

Young County: Allen Guiberson 1 H. R. Montgomery, 330 ft. from S and W Blk. 19, Brazos River Indian Reserve, T. S. Smith Sur., 2 mi. SW of Herron City, 2,750 ft., rotary test.

Fields

Allar, Young County: Panhandle Ref. 1-P Allar Co., 3,305 ft. from N, 1,295 ft. from W, Sec. 3409, T.E.&L. Sur., pump 49 bbl., Palo Pinto lime pay 1,673 ft., T.D. 1,697 ft., new pay.

Allar-Caddo, Young County: Panhandle Ref. 2-C Allar Co., 3,022 ft. from N, 495 ft. from E, Sec. 3409, T.E.&L. Sur., pump 77 bbl., Caddo lime pay 3,578 ft., acid 1,000 gal., T.D. 3,585 ft.

Archer County: Miller & Ward 5 S. B. Herron, Lot 12, Blk. 5, Clark & Plumb subd., pump 10 bbl., sand pay 840 ft., T.D. 848 ft.

Clay County: Spradling, McNatt & Clark 4 Taylor "Elliott," 150 ft. from N, 258 ft. from W, Blks. 55 and 56, Bacon subd., elev. 958 ft., I.P. 45 bbl., sand pay 1,124 ft., T.D. 1,132 ft.

East Bryson, Jack County: Paul P. Steed 3 G. L. Jones, 467 ft. from N, 505 ft. from E, NW quarter J. H. Nessmith Sur., flow 117 bbl., sand pay 2,961 ft., shot 35 qt., T.D. 2,987 ft.

Ellis, Jack County: Hanlon-Buchanan 2-A T. C. Jones, 495 ft. from S and E of lease, J. Williams sur., flow 374 bbl., elev. 1,083 ft., lime pay 4,782 ft., perf. 28 shots 4,782-87 ft., T.D. 4,953 ft.

Joy-Mississippi, Clay County: L. T. Burns 1 C. L. Lumpkin, 330 ft. from N and E, 100-ac. tract, H. Williams Sur., flow 1,008 bbl., lime pay 5,890 ft., T.D. 6,022 ft.

Joy, Clay County: Shell Oil 3 T. H. Brock, 660 ft. from N and W, Blk. 31, H. Williams Sur., elev. 1,052 ft., flow 1,552 bbl., lime pay 5,939 ft., acid 2,000 gal., T.D. 6,055 ft.

Howsley-McCord Throckmorton County: T. R. Putnam 7 fee, Sec. 10, Comanche Indian Reserve, dry, T.D. 666 ft.

Lupton & McLester, Young County: Belfort Oil 2 Medlan Primitive Baptist Church, 540 ft. from N and E, J. C. Brown Sur., flow 55 bbl., sand pay 3,813 ft., T.D. 3,839 ft.

Markley, Young County: Fresno Oil 1 H. O. Prideaux, A. Rohus Sur., dry, T.D. 737 ft.

McCrary, Wilbarger County: C. B. Christie 3 J. W. McCrary, Sec. 64, Blk. 14, H.&T.C.R.R. Sur., pump 102 bbl., sand pay 1,487 ft., T.D. 1,496 ft.

Montague County: Lesh & McCall 2 W. C. Henley, 330 ft. from E, 1,397 ft. from S, 116-ac. tract, Tilley Sur., pump 3 bbl., pay 2,437 ft., T.D. 3,016 ft.

Murray, Young County: Standard Oil of Texas and Hanlon-Buchanan 4 Sallie R. Donnell, 991 ft. from N, 1,400 ft. from E, Sec. 2371, T.E.&L. Sur., flow 960 bbl., Caddo lime pay perf. 60 shots, 3,745-50 ft., T.D. 4,606 ft.

Orth, Young County: Martin & Harvey 7 J. B. Daniel, Sec. 164, T.E.&L. Sur., pump 5 bbl., sand pay 871 ft., T.D. 877 ft.

Seymour, Baylor County: British-American Oil Prod 14 J. H. Turbeville, 1,005 ft. from E, 1,667 ft. from S, Sec. 198, T.& N.O.R.R. Sur., flow 240 bbl., lime pay 2,521 ft., acid 2,000 gal., T.D. 2,525 ft.

Swastika, Archer County: Sinclair Prairie Oil 10 Campbell Banking Co., Blk. 13, South Anderson Ranch subd., gas input, T.D. 1,346 ft.

Taubert & McKee, Jack County: Taubert & McKee and Sinclair Prairie 3 H. T. Boyd, 660 ft. from N, 1,980 ft. from E, Seth Hazel Sur., dry, Caddo 5,460 ft., Marble Falls 5,677 ft., Ellenburger 6,386 ft., T.D. 6,425 ft.

Texhoma Shallow, Wichita County: Cable Oil 25-B W. H. Willis, water input, T.D. 243 ft.

Cable Oil 27-B W. H. Willis, B.B.B.&C. Sur., A-29, water input, T.D. 246 ft.

Cable Oil 33-B W. H. Willis, B.B.B.&C. Sur., A-29, dry, T.D. 320 ft.

Cable Oil 25-B W. H. Willis, B.B.B.&C. Sur., A-29, water input, T.D. 297 ft.

Cable Oil 36-A W. H. Willis, B.B.B.&C. Sur., A-29, dry, T.D. 301 ft.

Cable Oil 37-A W. H. Willis, B.B.B.&C. Sur., A-29, water input, T.D. 282 ft.

Thornberry, Clay County: W. H. Metzner 1 Taylor & Metzner, Sec. 3, B.B.B.&C. R.R. Sur., dry, T.D. 1,172 ft.

Walnut Bend, Cooke County: Sinclair Prairie Oil 14 Neal Atkins, 330 ft. from N, 1,334 ft. from E, 198.2-ac. tract, Conrad Furnash Sur., elev. 830 ft., flow 778 bbl., Winger sand pay 5,517 ft., perf. 255 shots 5,519-70 ft., T.D. 5,591 ft.

Wichita County: Bourbon Roy, 1-A Lockridge, Netherly Sur., dry, T.D. 1,802 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: C. S. Miller 1 McClure 1,910 ft. from N, 1,449 ft. from W, of lease, E. Shipman Sur., elev. 1,863 ft., dry, T.D. 1,170 ft.

Clyde D. Lane 1 DeBusk, Rebecca Edwards Sur., elev. 778 ft., dry, T.D. 1,407 ft.

Coleman County: Hunter & Hunter 1 Dorothy Griffin, Hood County School Land, elev. 1,921 ft., dry, T.D. 3,768 ft

Jones County: Everts Drlg. 1 J. H. M. Commons, 330 ft. from N and W, Lot 8, Blk. 4, A.W. Hill Sur., dry, T.D. 1,948 ft.

Shackelford County: Lewis F. Green 1 I. N. Jackson, NW SW NE Sec. 68, Blk. 11, T.&P. Ry. Sur., dry, T.D. 746 ft.

(Continued on Page 66)

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CONTINENTAL

CALIFORNIA

Eastern Extension to Paloma Likely

LOS ANGELES, Calif. — Western Gulf Oil Co. appears likely to extend the productive limits of the Paloma distillate field in Kern County, as the company's 36-1 Los Angeles Athletic Club in 1-32s-26e has picked up the normal Paloma sand and is still in the probable pay at 11,146 ft. This outpost is located in the extreme eastern end of the field and its completion would extend the limits of production about 2,500 ft. north of the eastern end of the structure. The Paloma field was discovered by a joint wildcat drilled by Western Gulf and Texas Co., and based on development work to date is an extensive accumulation. All of the several wells in the field to date are normal condensate wells with the exception of General Petroleum Corp.'s outpost on the north flank of the structure, which was brought in flowing a normal 35-gravity crude.

Completion of General Petroleum's outpost as a black-oil well with a comparatively low gas-oil ratio indicates that other black-oil production may ultimately be found around the rim of the productive area. The oil sand found by General Petroleum was quite similar to that found by Gulf and others at higher locations, and for this reason it is impossible to predict whether production will be black or white before a well is completed. Possibly Gulf may get some black oil in its present Los Angeles Athletic Club outpost.

Fresno County. — Standard Oil Co. of California should be able to make a production test of 28-21-F in the Pleasant Valley field within the next few days and boost its completed wells in this field to two. This easterly outpost failed to get a satisfactory water shutoff last week on a test at 9,005 ft. and a recement job on the 7-in. was required at 8,979 ft. This well is too close to production to fail to get something after coring the Gatchell sand of Eocene age. Development work to date has been rather slow in this relatively new field as operators, Standard and R. S. Lytle, are feeling their way along. Standard has limited the productive area west of the southern end of the field by drilling a dry hole, and this indicates the productive limits will extend north of the discovery well. West of the Raisin City field, Seaboard Oil Corp. is testing some relatively thin streaks of oil sand in a wildcat being drilled in conjunction with Union Oil Co. and Tide Water Associated Oil Co. The outlook is not very good but drilling operations will continue as several thin zones were found in the Raisin City field to the east. The chief characteristic of this immediate area is a marked lenticularity in the sands which is not conducive to satisfactory correlation work.

Kern County.—The completion of a good well by Chanslor-Canfield Midday Oil Co. a few weeks ago which opened up a new productive area in the west end of the Midway field has greatly stimulated interest in the district and several new wells have already been started on adjoining leases and properties. Chanslor-Canfield Midway has already spudded in one new well and has derrick up for a second in 6-32s-23e. In 7-32s-23e to the south, Republic Petroleum Co. has spudded in 7-44 and has a derrick standing for 7-43 and location staked for 7-45. Chanslor-Canfield Midway should derive the greatest benefit from its discovery of a new productive area south of the town of Fellows because it holds all of 6-32s-23e, most of 7-32s-23e to the south, and all of 1-32s-22e to the west of the discovery well.

Gas wells. — A concerted move is under way in the central part of the state to develop commercial gas accumulations and additional discoveries may be anticipated. Ever so often operators go after gas production in a big way and then as often lose interest in this type of work. The present attempt to open up new gas fields reflects the inability of prospectors to discover new oil fields in which there is a chance for independent operators to engage in development work. Several new gas tests were started this week and several additional locations have been staked for early work. In the vicinity of Hamilton in Glenn County, Superior Oil Co. is preparing to drill a test on the Knight property in 3-21n-2w and will use the crew from 2 Dodge Lands which was abandoned by Superior in the Willows district, also in Glenn County. Texas Co. is preparing to drill a gas test in the vicinity of Denverton in Solano County and the well will be drilled on the Stewart lease in 7-4n-1e. Additional wells are being drilled to gas sands in proved fields including Bowerbank, Rio Vista, Lodi, and Marysville Buttes as well as in wildcat territory at Suisun in Solano County and near Dixon in Yolo County where Shell is preparing to start a wildcat on the Glide property in 15-7n-3e and Texas Co. is starting a gas test on the Winchester Lake property in 20-7n-4e.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County, Belridge Oil Co. 55-34-A fee, 34-28s-21e, pumped 85 bbl., 13.7-gravity, 28 per cent cut, T.D. 880 ft., 120-mesh perf. 576-880 ft., completed in South Belridge zone of Pleistocene age.

General Petroleum 6-1 Belridge, 1-29s-21e, pumped 34 bbl. net, 13.7-gravity, 40 per cent cut, T.D. 1,050 ft., P.B. 980 ft., perf. 599-635 ft., 844-65 ft., 915-80 ft., completed in South Belridge zone of Pleistocene age.

Coalinga, East, Fresno County: Standard 115-3-C fee, 3-20s-15e, pumped 20 bbl., 19.9-gravity, T.D. 3,340 ft., 60-mesh perf. 3,157-3,336 ft., completed in East Coalinga zone of Miocene age.

Coalinga, West, Fresno County: Standard 59-13-D fee, 13-20s-14e, pumped 38 bbl., 13.8-gravity, 20 per cent cut, T.D. 1,715 ft., perf. 1,265-1,541 ft., 1,586-1,614 ft., 1,636-1,710 ft., completed in West Coalinga zone of Pliocene age.

Kern Front, Kern County: L. C. Dougan 2 Sesnon, 17-28s-27e, pumped 48 bbl. net, 14.1-gravity, 60 per cent cut, T.D. 2,979 ft., P.B. 2,950 ft., 125-mesh perf. 2,906-69 ft., completed in Kern Front zone of Pliocene age.

Mount Poso, Kern County: Shell 38 Security, 16-27s-28e, pumped 112 bbl., 14.9-gravity, 14 per cent cut, T.D. 1,868 ft., 130-mesh perf. 1,792-1,867 ft., completed in Vedder zone of Miocene age.

Shell 38 Vedder, 16-27s-28e, pumped 160 bbl., 15.6-gravity, 25 per cent cut, T.D. 1,645 ft., perf. 1,569-1,645 ft., completed in Vedder zone of Miocene age.

Riverdale, Fresno County: Amerada 34-23 Courtney, 23-17s-19e, flowed 230 bbl., 38.1-gravity, 0.5 per cent cut, 150,000 cu. ft. gas, 12/64-in. bean, pressure 770/620 lb., T.D. 8,300 ft., P.B. 7,914 ft., perf. 7,853-7,915 ft., completed in lower Lawton zone of Eocene age.

Thornton, Sacramento County: Amerada 1 Capital, 36-5n-5e, flowed 7,000,000 cu. ft. gas, no oil, 40/64-in. bean, flowing pressure 806/1,192 lb., shut-in pressure 1,387/1,387 lb., T.D. 8,367 ft., P.B. 3,390 ft., Markley 2,325 ft., Nortonville 2,612 ft., Capay 3,355 ft., Cretaceous 4,454 ft., completed in Capay zone of Eocene age.

Willows wildcat district, Glenn County: Superior 2 Dodge Lands, 7-19n-1e, abandoned in barren gray sand, T.D. 5,882 ft., objective gas sand was absent, no important showings of any kind logged.

LOS ANGELES BASIN

Orange County. — H. R. Hamilton, who was recently awarded a permit to develop state tidelands off the Huntington Beach field, has started active drilling operations on the first well and is making good progress. Technical spud was made a few weeks ago to validate the contract while the validity was being established by an opinion of the state's attorney general who in effect ruled that the state had authority to make contracts with operators where state tidelands were being drilled. Mr. Hamilton's contract covers practically all undeveloped tideland acreage not heretofore leased and wells may be drilled to zones only partially produced and possibly to deeper Miocene horizons within the limitations of the contract. All wells must be located on litoral lands and whipstocked beneath the tidelands by directional drilling with which Mr. Hamilton is especially familiar, having been a pioneer in directional drilling at Huntington Beach when the tidelands development started. Signal Oil & Gas Co.'s outpost in the Newport district southeast of Huntington Beach is about 1,500 ft. deeper than the recent discovery well of D. W. Elliott in that district and at this writing does not present any too good a chance of getting the Elliott or Townsend sand. Only one well, the discovery project, has been completed to date. Starting of at least one more well in the near future is expected. The present well being drilled by Signal is west of the discovery well and appears to be off

(Continued on Page 72)

PERMIAN BASIN

Deep Wildcats Staked in Andrews, Gaines and Pecos

MIDLAND, Tex. — Several wildcat locations announced during the week claimed the attention in West Texas. In Andrews County, 5 miles east of the new field opened by it 2 weeks ago, Skelly Oil Co. announced a new location for its 1-M University, 660 ft. from north, 1,980 ft. from east Section 28, Block 1, University Survey, which will test the Permian horizons to 5,500 ft. Skelly 1-K University, SW SW Section 28, Block 9, University Survey, Holt pay producer, was setting pumping unit preparatory to taking official potential test. It is plugged back to 5,550 ft. from total depth 7,500 ft.

In southwestern Gaines County, Humble Oil & Refining will drill 1 R. A. Cox et al in C SW NE Section 14, Block A-11, Public School Land Survey, to 9,000 ft. or the Ordovician. The new wildcat is located 10 miles east of the Hobbs pool, and 12 miles south of the Russell pool, Clear Fork lime producer opened early this year. South offset to the pool opener is drilling below 5,945 ft. after drill-stem test of the Wasson Permian pay showed nothing. In the Cedar Lake pool, Stanolind Oil & Gas 15 American Warehouse Co., deep test, had reached 10,394 ft. and was drilling ahead. The deep test of Amerada 6 Robertson, east side of Seminole pool, was drilling below 8,200 ft. in lime, with 300 ft. needed to complete the original contract depth.

Pecos County: Two new deep tests were announced for the area around the Apco-Warner pool, both of which will go to the Ordovician. A quarter mile north of the new Tubb pay producer opened last month, Magnolia Petroleum Co. and Anderson-Prichard will drill another test, 2-96 State-Powell, 1,980 ft. from southwest and southeast lines of Section 96, Block 10, H.&G.N. Ry. Survey, to 5,000 ft., and 3½ miles southwest of the Apco-Warner Ordovician pool, Anderson-Prichard will drill 1 H. Johnson in NW NW Section 14, Block 140, T.& St.L. Ry. Survey, which falls a little over a mile west of a failure drilled by the same operators to 4,565 ft. but which had good showings of gas. Proposed depth of this wildcat is 6,000 ft. Standard Oil Co. of Texas 1 Douglas Oil, Section 9, Block 194, G.C.& S.F. Ry. Survey, total depth 9,141 ft., had cemented hole back to 8,730 ft. and was waiting on cement. Phillips Petroleum Co. 1 Ada Price, Section 11, Block 101, T.C.R.R. Survey, interesting deep test which showed gas 2 weeks ago, was drilling ahead after cleaning up fishing job. Last reported depth was 11,735 ft.

Yoakum County. — Hugh W. Stoddard, trustee, 1 R. M. Kendrick is a new 8,000-ft. wildcat in southeastern Yoakum County, 330 ft. from south and east lines of Section 784, Block D, J. H. Gibson Survey, 5 miles east of nearest producers in the Wasson pool.

Runnels County.—Eight miles northeast of Ballinger, in the Beddo area, L. E. Hults 1 C. C. Gray is located 990 ft. from the north line and 330 ft. from the west line of Subdivision 42, Section 147, E. T. Ry. Co. Survey. It is projected to 3,600 ft. or Palo Pinto lime if not productive in the Sarratt sand at about 2,300 ft.

WEST TEXAS COMPLETIONS

Wildcats

Runnels County: Callahan & Blakeley 1 Mrs. H. T. Arnold, 660 ft. from N and E, Sec. 333, H.&T.C. Ry. Sur., elev. 1,785 ft., dry, T.D. 2,890 ft.

Winkler County: Stanolind O. & G.-Shell Oil 1 W. D. Blue, 990 ft. from N and W. Sec. 15, Blk. 46-1s, T.&P. Ry. Sur., elev. 3,098 ft., flow 1,370 bbl., Ellenburger lime 10,493 ft., perf. 300 shots 10,647-97 ft., T.D. Discovery, Wheeler pool.

Fields

Apco-Warner, Pecos County: Magnolia Pet. 3 E. E. Fromme, 660 ft. from SE, 660 ft. from SW, Sec. 106, Blk. 10, H.&T.C. Ry. Sur., elev. 2,457 ft., flow 790 bbl., Ellenburger lime pay 4,515 ft., acid 2,000 gal., perf. 250 shots 4,515-70 ft., T.D. 4,697 ft.

Halley, Winkler County: Skelly Oil 58 S. M. Hallett, 990 ft. from S, 330 ft. from E. Sec. 13, Blk. B-12, Public School Land, flow 400 bbl., pay 2,760 ft., shot 207 qt., T.D. 2,870 ft.

Lehn, Pecos County: Burk Roy 14 Jennie Sullivan, 843 ft. from N, 1,980 ft. from W, Sec. 72, Blk. 10, H.&G.N. Ry. Sur., elev. 2,434 ft., I.P. 13 bbl., pay 1,713 ft., T.D. 1,738 ft.

McCamey, Upton County: Trebol Oil 2-C R. P. Ricker, 2,825 ft. from NE, 3,013 ft. from NW, Sec. 6, Blk. R, E. C. Grooms Sur., elev. 2,926 ft., pump 119 bbl. nat., Grayburg lime pay 2,547 ft., T.D. 2,554 ft.

McKee, Crane County: Magnolia Pet. 2 D. K. Glenn, 1,980 ft. from NE, 660 ft. from SE, Sec. 20, Blk. 1, H.&T.C. Ry. Sur., elev. 2,425 ft., flow 357 bbl., McKee sand pay 6,111 ft., T.D. 6,121 ft.

Sand Hills, Crane County: Magnolia Pet. 3 Katie W. Lee, 1,980 ft. from S, 660 ft. from W, Sec. 9, Blk. 32, Public School Land, elev. 2,601 ft., flow 389 bbl., Clear Fork lime pay 4,266 ft., T.D. 4,601 ft.

Slaughter, Hockley County: J. C. Hawkins 32-A Mallett, 580 ft. from N and W, Lab. 18, Lge. 47, Edwards County School Land, elev. 3,616 ft., flow 916 bbl. San Andres lime pay 4,905 ft., acid 11,500 gal., T.D. 4,975 ft.

Honolulu Oil 28-B Mallett, 580 ft. from N and E, Lab. 16, Lge. 48, Edwards County School Land, elev. 3,615 ft., flow 279 bbl., lime pay 5,051 ft., acid, P.B. to 5,031 ft. from T.D. 5,081 ft.

T. F. Morrow 26 Mallett, 580 ft. from S and E, Lab. 13, Lge. 48, Edwards County School Land, flow 1,458 bbl., lime pay 4,940 ft., acid, T.D. 4,983 ft.

Taylor-Link, Pecos County: Cardinal Oil 1-G University, 330 ft. from E, 2,330 ft. from S, Sec. 32, Blk. 16, University Sur., elev. 2,536 ft., flow 73 bbl., Yates sand pay 1,395 ft., shot 60 qt., T.D. 1,408 ft.

Walker, Pecos County: Cardinal Oil 1-F University, 1,624 ft. from N, 330 ft. from E, Sec. 14, Blk. 16, University Sur., elev. 2,920 ft., flow 84 bbl., sand pay 2,920 ft., shot 40 qt., T.D. 2,057 ft.

J. L. Cooper 4 University, 990 ft. from E, 1,650 ft. from S, Sec. 13, Blk. 16, Univ. Sur., elev. 2,983 ft., flow 78 bbl., pay 2,103 ft., shot 60 qt., T.D. 2,124 ft.

Wasson Gaines County: Mabee Oil & Gas 2-A Oil Dev. Co., 1,650 ft. from N, 990 ft. from E, Sec. 39, Blk. AX, Public School Land Sur., elev. 3,519 ft., flow 899 bbl., lime pay 4,960 ft., acid 12,000 gal., T.D. 5,040 ft.

White & Baker, Pecos County: Cardinal Oil 7-B White & Baker, 1,010 ft. from S, 990 ft. from W, Sec. 36, Blk. Z, T.C. R.R. Sur., elev. 2,674 ft., flow 97 bbl., Grayburg lime pay 1,644 ft., shot 60 qt., T.D. 1,688 ft.

PANHANDLE

AMARILLO, Tex. — Third active wildcat for the Panhandle district was announced last week, this one to be in Donley County. Shamrock Oil & Gas Co. Cornelia Adair estate is staked 510 ft. from the most westerly west line and 660 ft. from the most southerly south line of 666.3-acre tract in Section 15, Block A, John G. Adair Survey, 6 miles southeast of Clarendon. It is to go to Ellenburger, lower Ordovician. In Parmer County, Stanolind Oil & Gas Co. 1 A. J. Jarrell, Bovina area, was rigging up and was to spud early this week. Stanolind Oil & Gas Co. 1 Corbin, Armstrong County wildcat, was shut down for engine repairs, total depth 5,340 ft.

PANHANDLE COMPLETIONS

Carson County: Cities Service Oil 1 Eller, 330 ft. from S, 990 ft. from W, Sec. 9, Blk. 7, I.&G.N.R.R. Sur., dry, T.D. 2,860 ft

Hutchinson County: Skelly Oil 11-A W. E. Herring, 3,647 ft. from N, 2,862 ft. from W, Eucibo Almaguel Sur., elev. 3,219 ft., I.P. 211 bbl., pay 3,070 ft., T.D. 3,114 ft.

J. M. Huber Corp. 30 Weatherly, 1,250 ft. from S, 2,600 ft. from W, Sec. 25, Blk. Y, A.&B. Sur., elev. 3,103 ft., I.P. 57 bbl., pay 3,012 ft., T.D. 3,050 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Grayburg-Jackson, Eddy County: Western Prod. 1 Nunlee, SE SE 27-16s-30e, flow 540 bbl., lime pay 2,935 ft., shot 140 qt., T.D. 2,993 ft.

Lynn, Lea County: Repollo Oil 2-F State, SE NE 17-23s-36e, flow 538 bbl., lime pay 3,685 ft., T.D. 3,775 ft.

Maljamar, Lea County: Johney Cockburn 16-B Pearl Miller, NE SW 30-17s-33e, flow 250 bbl., lime pay 4,135 ft., shot 280 qt., T.D. 4,264 ft.

South Eunice, Lea County: Gulf Oil 1-F Janda-State, SW SW 4-22s-36e, flow 129 bbl., lime pay 3,805 ft., acid 3,000 bbl., T.D. 3,870 ft.

West Central Texas

(Continued from Page 63)

Fields

Bluff Creek, Shackelford County: Roeser-Pendleton 1-B J. P. Morris, SE SE NW Sec. 205, E.T.R.R. Sur., dry, T.D. 2,012 ft.

Crownover, Brown County: Guyle Greynolds 1-A Annie Innes, Sec. 26, B.B.B. &C. Ry. Sur., dry, T.D. 1,049 ft.

Ivan, Stephens County: Old well drilled deeper, Helmerich & Payne 1 M. O. Kennedy, 1,240 ft. from S, 990 ft. from W, Sec. 1031, T.E.&L. Sur., dry, old T.D. 3,927 ft., Caddo 3,201 ft., Marble Falls 3,903 ft., Ellenburger 4,424 ft., T.D. 4,437 ft.

Shackelford County: W. F. Palmer 1 J. H. Dillers, Sec. 2-B H.T.&B. Sur., dry, T.D. 575 ft.

Strawn, Palo Pinto County: T. P. C. & O. 3-A fee-Ryan, Isaac Ryan Sur., dry, T.D. 3,665 ft.

Wimberly, Jones County: Maracaibo Oil Explor. 2 A. M. Wimberly, 330 ft. from N and W, 40-ac. lease, Blk. 87, Lge. 126, De Witt County School Land, flow 138 bbl., 44° gravity, lime pay 2,444 ft., acid 2,000 gal., T.D. 2,446 ft.

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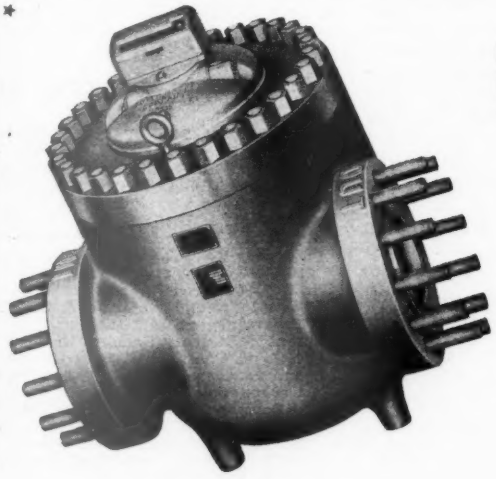

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EASTERN TEXAS

New Deep Tests Located In Northern Sector

DALLAS, Tex.—Search for oil from the deeper horizons is reaching a rapid pace in East Texas, several new locations being announced during the past week. In Hunt County, Humble Oil & Refining Co. will drill another Smackover lime test 5 miles southwest of Greenville, known as 1 Josie Rutherford, located 2,300 ft. from east line and 1,980 ft. from north line of S. Lindsay Survey. The new test falls about 10 miles northwest of Humble Oil & Refining 1 Graham, which topped the Smackover at 9,017 ft. and was shut down at 9,193 ft. at last report. The wildcat of J. F. Morrissey et al 1 Rollins, James Miller Survey, 3 miles northwest of Campbell, which promised to produce from the Woodbine sand at about 2,800 ft., was being drilled deeper below 3,500 ft., headed for the Paluxy.

Wood County.—A. H. and C. L. Rowan et al 1 M. T. Garrett is a new location for 7,000-ft. wildcat test 8 miles southeast of Winnsboro. It is located 1,634 ft. north, 912 ft. east of the southwest corner of 218½-acre tract in Polly Tier Survey. Gulf Oil Corp. 1 K. C. Brewer et al is located 610 ft. from west, 722 ft. from north lines of 74-acre tract in Benjamin Lee Survey, 2½ miles southwest of Winnsboro, and will explore the Paluxy zones. Another try for production was to be made near Alba by Plains Production Co. at its 1 Mit Cox, 160 ft. from east, 2,150 ft. from south lines of Joseph Simpkins Survey, ¾ mile south of the townsite.

Hopkins County.—Derrick was up on L. A. Grelling, Jr., 1 W. Blalock, 2,250 ft. from west, 1,820 ft. from south lines of Procella Survey, 2½ miles southwest of Como. It is scheduled to test the Paluxy.

Rusk County.—Beacon Oil & Gas Co. 1 J. H. Allen is located 660 ft. from north and northeast lines of 140-acre tract in Taylor Brown Survey, 9,000-ft. project 3½ miles northwest of Henderson.

Anderson County.—A Trinity test in the Cayuga field was staked by Roeser & Pendleton 2,443 ft. from south, 577 ft. from east lines of M. Ellis Survey, on L. R. Billett farm and will be known as 6-B Billett.

Upshur County.—J. R. Meeker 1 Hobart-Henton, a 5,500-ft. test, is located 490 ft. from east, 889 ft. from south lines of 75-acre tract, R. Asher Survey, 2 miles northwest of Ore City, in northeast part of county.

Houston County.—Geier Brothers & Weggener and Sunray Oil Co. 1 W. W. Spence, Woodbine test, 1,100 ft. from southwest, 1,125 ft. from southeast lines of northwest 100-acre tract, J. D. Procella Survey, 4 miles west of Grapeland.

Deep tests.—Kaufman County, Sun Oil 1 Rutledge, drilling 8,850-ft. sand and shale. Morris County, Humble Oil & Refining 1 Wright, drilling 7,520 ft. Van Zandt County, Hunt Oil 1 Parker, J. Sparks Survey, cored 6,185-6,246 ft., showed some porosity in sand at 6,140-45 ft., drilling ahead 6,385 ft., sand and shale.

EAST TEXAS COMPLETIONS

Wildcats

Franklin County: L. A. Grelling, Jr., et al 1 J. P. Stanley, 396 ft. from N'ly N, 330 ft. from N'ly W tract in W. B. Jordan Sur., elev. 521 ft., dry, Woodbine 4,377 ft., Paluxy 6,080 ft., Pettit 8,254 ft., Travis Peak 8,364 ft., T.D. 8,442 ft.

Robertson County: Magnolia Pet. 1 Pauline Doremus, 330 ft. from NE, 913 ft. from SE, 20-ac. tract, Samuel Kinney Sur., elev. 333 ft., dry, Woodbine 4,203 ft., Trinity 5,164 ft., Pettit 6,687 ft., Travis Peak 6,898 ft., T.D. 7,217 ft.

LOUISIANA GULF

Deepest Producer Completed As Distillate Well

NEW ORLEANS, La.—Deepest oilfield production in the world has been established by Union Producing Co. et al at 1 Fitzpatrick-Vizard, in the De Large field, Terrebonne Parish. The well, drilled to total depth of 13,563 ft. and plugged back to 13,502 ft., flowed 5,970,000 cu. ft. of gas through ¼-in. choke from perforations at 13,475-90 ft. Working pressure was 4,300 lb., and closed-in pressure 4,500 ft. An ungaged volume of distillate accompanies the gas. The well was shut in pending construction of a line to carry the gas to the United Gas Pipe Line system, which supplies New Orleans and other southern cities. The record for deep production has been held heretofore by another well in the same field, Fohs Oil Co. 1 Buckley-Bourg, which was completed at total depth of 13,266 ft. Fohs has an interest in the Fitzpatrick-Vizard.

A new deep oil pool has been opened by Continental Oil Co. 1 Acadia Parish School Board, a mile north of the Ritchie field, in Acadia Parish. The well was swabbed in, flowing 34.7-gravity oil from perforations at 8,580-90 ft. No report has been made as to the quantity of the flow. On a 10-hour gage, flowing through an 11/64-in. choke for 5 hours and through a 9/64-in. choke for 5 hours, the well is reported to have produced 153 bbl. It was shut in pending erection of storage. Regular production in the Ritchie field is in the neighborhood of 3,500 ft. Total depth of the discovery is 9,909 ft. in a sidetracked hole, and 7-in. casing was set at 9,237 ft.

Cameron Parish.—Continental 1 Adolph Hebert, Jr., in the Big Lake area, was drilling plug on the 9⅝-in. casing. This test, slated to go to 12,000 ft., is to be carried to 12,500 ft. Pure Oil Co. has started preliminary work at its wildcat test in the East Grand Lake area, the 1 State 549-Snake Lake.

Terrebonne Parish.—Humble Oil & Refining Co. was drilling at 6,721 ft. in sandy shale at its 1-C Continental Land & Fur Co., 4 miles south of the Gibson field. No important shows have been reported by Union Oil Co. of California 1 Calvert & Todd, a mile north of Houma. The hole was at 11,535 ft. last week.

Evangeline Parish.—Danciger Oil & Refining Co. 1 Hattie Haas, in the Reddell area, at 11,084 ft. in shale. It was said the operator would begin coring again at about 11,120 ft. The original projected depth for this test was 10,500 ft., but it was decided to carry the hole deeper. Oil shows were reported to have been logged in higher levels.

Beauregard Parish.—Phillips Petroleum Co. has staked location for a third test in the new Bear field, opened by General Crude Oil Co. last April. The second completion in the pool was a Phillips operation, and its initial production was 348 bbl., compared with the 151-bbl. yield of the discovery. The new test is 3 First National Bank of Beaumont, in 22-6s-9w.

La Fourche Parish.—Completion of Sun Oil Co. 1 Mire, an extension test at the Chacahoula field, is held up by mechanical trouble. The hole is at plugged-back depth of 9,020 ft.

LOUISIANA GULF COAST COMPLETIONS

Fields

Bayou Sale, St. Mary Parish: Humble 3-E Miami Corp., 43-16s-93, on 17-hr. state potential test flowed at rate of 252 bbl. through 9/64-in. choke, T.P. 1,800 lb., gas-oil ratio 555, perf. 10,100-14 ft., T.D. 10,260 ft., P.B. 10,146 ft.

Bully Camp, Lafourche Parish: Texas Gulf Sulphur Co. 4 Delta Securities Co., Inc., 36-18s-20e, dry at 2,050 ft.

Chalkley, Cameron Parish. Grubb & Hawkins 1 Sweet Lake Land & Oil Co., 6-12s-6w, dry at 8,413 ft.

Charenton, St. Mary Parish: Fifteen Oil Co. 4 South Coast Corp., 26-13s-10e, junked and abandoned at 8,672 ft. in third sidetracked hole.

Lake Salvador, St. Charles Parish: Texas 20 State-Lake Salvador, Lake-16s-22e, 398 bbl. through 5/32-in. choke, T.P. 1,750 lb., gas-oil ratio 1,367, perf. 9,940-55 ft., T.D. 10,350 ft.

Paradis, St. Charles Parish: Texas 12 Sunset Realty & Planting Co., 38-14s-20e, 260 bbl. through 9/64-in. choke, T.P. 1,800 lb., gas-oil ratio 744, perf. 10,128-42 ft., T.D. 10,940 ft., P.B. 10,160 ft.

Pine Prairie, Evangeline Parish: Pan American 2 Crowell Land & Mineral Co., 2-4s-1w, 489 bbl. through ¼-in. choke, T.P. 1,175 lb., gas-oil ratio 1,028; perf. 8,617-38, 8,646-54, and 8,660-84 ft.; T.D. 8,801 ft., P.B. 8,708 ft.

Ville Platte, Evangeline Parish: Continental 2 Vidrine-Reed-Vidrine Unit, 28-3s-2e, 167 bbl. through 8/64-in. choke for 5 hr. and 10/64-in. choke for 19 hr., T.P. 600 lb., C.P. 2,300 lb., gas-oil ratio 470, perf. 9,110-30 ft., T.D. 10,253 ft., P.B. 9,150 ft.

ILLINOIS

Three New Pools in Sight in Clay and Edwards Counties

CENTRALIA, Ill.—A new pool is in sight in Edwards County where S. C. Yingling et al 1 Myers, NE NW NW 11-1n-14w, flowed 70 bbl. per hour for a time, and 769 bbl. in 24 hours from Rosiclare lime. Production then dropped to about 25 bbl. per hour. The pay is at 2,861-76 ft., total depth.

Another pool opener in Edwards County is Ray Ryan and W. G. Fortner 1 Ralston, 5 miles west of West Salem, in E½ SW SE 9-1n-10e. It flowed 609 bbl. in 23 hours from McClosky lime at 3,269-76 ft., total depth.

Thirty-two new operations were started in Illinois in the past week, including 9 wildcats as follows: Yingling et al 1 H. Richey, NE NE SE 10-2n-10e, Edwards County; Pure Oil Co. 1 Rush, C SW SE 19-3n-9e, Richland County; Cities Service 1 Vaught, C W½ SW NE 33-2s-9e, Wayne County; Lario Oil & Gas Co. 1 Pierce-Holloway, NW SE NE 15-1s-4e, Jefferson County; Davison et al 1 Berkinstock, NE NW NE 8-4n-3w, Clinton County; F. J. Burkett 1 W. R. Worley, SE NW NE 31-15n-10e, Douglas County; Big Chief Drilling Co. 1 Wolk, SW SW NE 8-9n-7e, Cumberland County; Big Chief 1 Fehrenbacker, SE SE SW 28-6n-9e, Jasper County, and National Association 1 Kincaid, NW NE SE 17-5n-6e, Clay County.

ILLINOIS COMPLETIONS

Wildcats

Bond County: National Refining 1 Clem Ulment, SE SW SW 16-4n-3w, dry at 1,253 ft., Cypress 912 ft., Cypress sand 983-1,000 ft., Paint Creek 1,031-33 ft. and 1,051-56 ft., Benoist 1,058 ft., Benoist sand 1,077-88 ft., Aux Vases sand 1,112-46 ft., Ste. Genevieve 1,154 ft., no McClosky lime.

Clinton County: Wiser 1 Jantzin, NW SW NE 33-2n-2w, dry at 1,576 ft., Tar Springs 888 ft., upper Glen Dean 979 ft., Hardinsburg 1,016 ft., Golconda 1,035 ft., Barlow 1,124 ft., Cypress 1,184 ft., Paint Creek 1,248 ft., Benoist 1,305-26 ft., Renault 1,357 ft., Aux Vases 1,365 ft., Ste. Genevieve 1,446 ft., Fredonia 1,506 ft.

Black & Pearson 1 H. Kluth, SW SW SW 22-2n-1w, dry at 3,028 ft., P.B. to Cypress sand which tested water. A Devonian lime test.

Franklin County: W. I. Lewis and Jack Darnell 1 N. H. Mallory, SE SE NE 20-5s-2e, pumped 25 bbl., Aux Vases sand 2,705-11 ft., T.D. 2,891 ft., P.B. to below Aux Vases.

Randolph County: General O. & G. Synd. 1 Schmoll, SW SW NE 28-4s-7w, dry at 438 ft.

Marion County: Big Chief 1 Deetrich, NW NW SE 15-3n-3e, dry at 2,508 ft., Glen Dean 1,930 ft., Hardinsburg 1,970 ft., Golconda 2,000 ft., Barlow 2,104 ft., Cypress 2,146 ft., Paint Creek 2,190 ft., Benoist 2,245 ft., Benoist sand 2,274 ft., lower Renault 2,310 ft., Aux Vases 2,358 ft., Ste. Genevieve 2,399 ft., Rosiclare 2,424 ft., no McClosky, St. Louis 2,504 ft.

Mid-Continent 1 Kleeman, NE NW SW 11-4n-1e, dry at 1,867 ft., Benoist 1,640 ft., Renault 1,678 ft., Aux Vases 1,702 ft., Ste. Genevieve 1,769 ft., Rosiclare 1,786 ft., Fredonia 1,834 ft., St. Louis 1,860 ft.

White County: E. J. Kobat 1 Kuykendall, C N½ NE NW 25-4s-10e, dry at 3,121 ft., upper Kincaid 1,841 ft., lower Kincaid 1,946 ft., Degonia 1,969 ft., Menard 2,192 ft., lower Menard 2,328 ft., Tar Springs 2,372 ft., upper Glen Dean 2,414 ft., lower Glen Dean 2,449 ft., Golconda 2,532 ft., Barlow 2,654 ft., Cypress 2,748 ft., Ste. Genevieve 2,971 ft., Fredonia 3,000 ft.

Lawrence County: Olds Drilling 1 Corrie et al, NE SW NE 11-2n-12w, dry at 1,731 ft., Glen Dean 1,367 ft., Hardinsburg 1,395 ft., Barlow 1,566 ft., Cypress 1,645 ft., Benoist 1,715-25 ft.

Big Four Petroleum & Gas 7 Buchanan, SW SE SW 8-3n-13w, dry at 3,567 ft., Ste. Genevieve 1,735 ft., St. Louis 1,839 ft., Salem 2,045 ft., Warsaw 2,362 ft., Louisiana 2,950 ft., Devonian 3,128 ft.

Fields

Aden, Wayne County: Texas 2 J. M. Harris, SW SW NW 4-3s-7e, old McClosky lime well, T.D. 3,339 ft., P.B. to 3,280 ft. and casing perforated with 51 holes opposite Aux Vases sand, topped at 3,199 ft. pumped 154 bbl. oil and 36 bbl. water.

Boulder, Clinton County: Texas 11 Price Gray community, C SW SE 35-3n-2w, flowed 109 bbl. of oil and 14,000 cu. ft. of gas, then 80 bbl. of oil, 4½ per cent sediment and water. Devonian lime top 2,532 ft., T.D. 2,658 ft.

Clay City, Wayne County: Pure 4 W. G. McCracken, SE NW NW 3-1n-8e, pumped 3 bbl. oil, 2 bbl. water, McClosky lime 3,040-43 ft., and 3,082-86 ft., T.D. 3,115 ft.

Pure 1 R. T. Reid, SE SE SW 35-2n-7e, Clay County, pumped 108 bbl., Aux Vases sand at 2,906-31 ft., T.D. 2,935 ft.

Sailor Springs, Clay County: Gulf 5 Keck, SE SE SE 26-4n-7e, pumped 30 bbl., Tar Springs sand 2,306-19 ft., T.D. 2,327 ft.

Covington, Wayne County: Deep Rock 4 J. E. Stroup, C NW SE 29-1s-7e, dry at 3,280 ft., Glen Dean 2,653 ft., Barlow 2,886 ft., Aux Vases 3,146 ft., Ste. Genevieve 3,280 ft.

Dale-Hoodville, Hamilton County: Pure 1 Johnson, NW SE SW 18-6s-7e, flowed an average of 1,190 bbl. per day for 3 days, Tar Springs sand 2,429-45 ft. and 2,452-64 ft., T.D. 3,122 ft.

Friendsville, Wabash County: W. E. Bailor 1-A Michael, C W½ SE SE 27-1n-13w, pumped 35 bbl. oil and 5 bbl. water, Levias lime 2,628-32 ft., McClosky lime 2,647-53 ft., acid., T.D. 2,667 ft.

Iola, Clay County: Central P. L. 11-A John Pilcher, C NW NW 13-5n-5e, pumped 80 bbl., McClosky lime 2,445-55 ft., acid., T.D. 2,457 ft.

Luttrell et al 11-A Reed heirs, NE SW NW 14-5n-5e, pumped 175 bbl., shot at 2,352-67 ft. in Aux Vases sand, T.D. 2,387 ft.

Lancaster, Wabash County: Hayes & Wolf 1 E. Newkirk, C S½ SW SW 4-1n-13w, pumped 35 bbl., Benoist sand 2,546-60 ft., shot, T.D. 2,560 ft.

Hayes & Wolf 3 A. R. Hinderliter, NW NE NW 9-1n-13w, pumped 25 bbl. oil, 5 bbl. water, Benoist sand 2,535-40 ft., shot, T.D. 2,548 ft.

Mount Carmel, Wabash County: Texas 2 W. P. Steckler, SW NE SE 8-1s-12w, pumped 112 bbl., Cypress sand 1,999-2,010 ft., shot, T.D. 2,011 ft.

Mount Erie, Wayne County: Pure 2 L. A. Blackburn A, C NE NW 35-1n-8e, pumped 2 bbl., McClosky lime 3,097-3,100 ft., acid, T.D. 3,120 ft.

New Harmony, White County: Whisenant & Trenchard 1 E. E. Owen, SW NW NW 18-4s-14w, pumped 65 bbl., Benoist sand 2,800-43 ft., shot, T.D. 2,853 ft.

New Haven, White County: Hiawatha 6 Jack Vail, NE NE SE 19-7s-11e, pumped 30 bbl., Aux Vases sand top 2,723 ft., T.D. 2,740 ft., shot.

North Calvin, White County: W. C. McBride, Inc., 2 Arnold-Hon, NW SW NE 6-4s-14w, pumped 100 bbl., Biehl sand 1,620-60 ft., shot, T.D. 1,562 ft.

Patoka, Marion County: Adams 2-D Adams, C NE SW 29-4n-1e, pumped 45 bbl., Benoist sand 1,419-43 ft., shot, T.D. 2,961 ft., P.B. to 1,441 ft.

Rural Hill, Hamilton County: Ohio Oil 1 O. C. Smith, NW SE NW 24-6s-5e, an old Aux Vases sand well deepened to McClosky at 3,247-58 ft., flowed 135 bbl. in 5 hr. through ½-in. choke.

Russellville, Lawrence County: Kentucky Nat. Gas 1 Scott Gray, C NE NW 19-4n-10w, 2,156,000 cu. ft. of gas, Bridgeport sand 745-71 ft., T.D. 798 ft.

Salem, Marion County: Big Chief 1 Luttrell, SW NW NW 10-1n-2e, pumped 52 bbl., Rosiclare 2,070-84 ft., T.D. 2,104 ft.

South Covington, Jefferson County: Ohio Fuel Supply 1 Nussbaum, C NW SW 13-2s-6e, pumped 375 bbl. oil and 15 bbl. water, McClosky lime 3,308-19 ft., acid., T.D. 3,335 ft.

Walpole, Hamilton County: Texas 1 C. Cotter, SE NE SW 34-6s-6e, pumped 144 bbl. oil, 24 bbl. water, Aux Vases sand 3,113-33 ft., shot, T.D. 3,133 ft.

West Frankfort, Franklin County: E. S. Adkins 30 Peabody Coal, NE SW SW 18-7s-3e, pumped 130 bbl., 10 per cent water, Tar Springs 2,042 ft., T.D. 2,074 ft.

West Mount Carmel, Wabash County: Dean Morton 1 Goodson, SW SW NE 14-1s-13w, dry, Waltersburg sand 1,902-16 ft.

MICHIGAN

Wildcatting Becoming Active As Field Development Drops

SAGINAW, Mich.—Increasing activity among Michigan oil operators in the search for new sources was reflected again this week in the demand for drilling permits as the state Conservation Department approved 19 additional tests in 13 counties. The new permits raised the total for the year to 280, more than half of them being issued in the past 2 months. Newaygo and Van Buren counties are locations for three each, Allegan and Missaukee for two each, the others being Barry, Midland, Wayne, Mecosta, Lake, Oceana, Arenac, Ogemaw and Clare, one each.

The pace of completions slowed last week, however, only five being recorded, including a 1,200-bbl. producer developed by Smith Petroleum Co. in Section 8 of Fork Township, Mecosta County, and another addition to Bay County'r Kawkawlin Township field, completed by Gulf Refining Co. The other completions were dry holes.

MICHIGAN COMPLETIONS

Bay County, Kawkawlin Township; Gulf Refining Co. 2 Peter White, C N½ NW SE 33-15n-4e, pumped 59 bbl. first 18 hr., acidized, T.D. 2,947 ft.

Kent County, Bowne Township: Three A Drilling Co. 1 J. Barnes, C SW SW 32-5n-9w, wildcat test, dry, T.D. 2,115 ft.

Mecosta County, Fork Township; Smith Petroleum Co. 1 Harold Plummer, C S½ NW SW 8-16n-7w, 1,200 bbl., acidibed, T.D. 3,813½ ft.

Missaukee County, Riverside Township: Taggart Brothers Co. 62 DeBree-Ardis, C SE 22-21n-7w, dry hole, T.D. 1,398 ft.

West Branch Township: American Drilling Co. 1 Lucy Miller, C S½ SW SE 27-23n-6w, wildcat test, dry, T.D. 3,783 ft.

SOUTHWEST TEXAS

Exploration Takes Upturn In Rio Grande Valley

CORPUS CHRISTI, Tex. — Wildcatting activity in the Rio Grande Valley is undergoing a pronounced upturn. New locations have been staked in Starr, Hidalgo, Willacy, and Zapata counties, and more are in prospect. George H. Echols, independent operator, who opened the Aviator field in Webb County, among others, is to drill a 7,000-ft. test, 1 Volpe estate, in the northern part of Zapata County, 7 miles from the Lopena field. Five other wildcats are either spotted or making hole in that county. The Echols well will test the Wilcox and go to the Midway. In Hidalgo County, Arkansas Fuel Oil Co., which brought in a deep gas well in the Penitas prospect about a year ago, will drill a deep test about 5,700 ft south of the Missouri Pacific Railroad, in Porcion 46. There has been much seismograph and core-drill prospecting in the county. Including the latest, C. I. Olsen's 1 Lincoln, in the San Juan de Carricitos grant, four wildcat locations have been staked in Willacy County. Eight wildcat tests are in varying stages of progress in Starr County, and according to reports, more are in prospect north of the Barbacoas field.

Bee County.—Pure Oil Co. may open a new oil field at its 1 Mrs. Nannie Tuttle, 2 miles southwest of Blanconia. Oil shows are said to have been logged at 3,974-4,003 ft. and at 4,947-85 ft. Total depth is 5,605 ft., and 5½-in. casing was run at 5,010 ft.

Duval County.—H. J. Porter et al 1 C. M. Robinson, 2 miles southeast of the Fitzsimmons field, recovered 125 lb. working pressure and 300 ft. of oily mud on a 28-minute drill-stem test at 4,647-53 ft. Total depth is 4,857 ft. The well was waiting for cement to set after setting 5½-in. casing at 4,700 ft. Sun Oil Co. 1 E. J. Couling was coring at 3,258 ft. in salt-water sand. This wildcat is 5 miles south of the Kreis field.

De Witt County.—Superior Oil Co. of California has staked location for a new test in the Slick (Wilcox) sand pool, north of production, in the Marcus Sewell Survey. It is the 1 W. H. Riedel.

Nueces County.—J. E. Thomas' 1 Jalufka heirs, 3 miles southwest of Clarkswood, was rigging up for a wildcat test.

Gonzales County. — Baldridge & King et al 1 Eugene Bowers, 3½ miles southeast of Waelder, was drilling at 3,326 ft. in shale.

SOUTH CENTRAL TEXAS

Wildcats

Gonzales County: H. H. Coffield 1 J. H. Harris, 7 mi. S of Waelder, dry at 5,287 ft. in first sidetracked hole.

LOWER GULF COAST COMPLETIONS

Wildcat

Karnes County: H. H. Howell 1 J. Demmer, 3 mi. NE of Gillette, dry at 5,495 ft.

Victoria County: Continental 1 W. C. Maroney, 3 mi. NW of Bloomington, dry at 7,017 ft.

Fields

Greta, Refugio County: Monday Oil Co. 9 J. F. B. Heard, 102 bbl. through ⅛-in. choke, T.P. 455 lb., C.P. 1,760 lb., gas-oil ratio 310, perf. 4,400-7 ft., T.D. 6,468 ft.

Hobson, Karnes County: Seaboard 1 R. J. Moczygamba, E. Seguin grant, A-10, 133 bbl. through 5/32-in. choke, T.P. 330 lb., C.P. 565 lb., gas-oil ratio 111, perf. 4,000-6 ft., T.D. 4,009 ft.

Midway, San Patricio County: British-American 2 F. M. Boykin, Sr., S.A.& M.G.R.R. Sur., A-252, 138 bbl. through ⅛-in. choke, T.P. 940 lb., S.I. C.P. 1,080 lb., gas-oil ratio 700, perf. 6,120-30 ft., T.D. 6,165 ft.

Odem, San Patricio County: Seaboard 7 H. A. Smith, Juan Hart & Son Sur., A-10, 95 bbl. through 7/64-in. choke, gas-oil ratio 1,473, perf. 3,919-20 ft., T.D. 6,455 ft.

South Caesar, Bee County: Atlantic 1 Tom Slick, 37 bbl. through 5/64-in. choke, T.P. 1,790 lb., gas-oil ratio 6,100, perf. 6,544-46 ft., T.D. 6,653 ft., P.B. 6,546 ft.

Mid-States Oil Corp. 1 M. Grissom, R. B. McEarly Sur., 104 bbl. through 7/64-in. choke, T.P. 1,280 lb., C.P. 2,160 lb., gas-oil ratio 1,631, T.D. 6,605 ft.

SOUTH TEXAS COMPLETIONS

Wildcats

Starr County: Hagen & Stewart 1 G. Ramos, 2 mi. SW of Buena Vista, dry at 1,296 ft.

Jim Hogg County: Humble 4-B Mestena Oil & Gas Co., 12 mi. S of Hebbronville, dry at 5,700 ft.

Fields

Aviator, Webb County: Dulup Oil Co. 8 Puig Bros., Alberca de Arriba grant, 115½ bbl. of oil plus 12 bbl. salt water, pumping, T.D. 1,815 ft.

Boyle, Starr County: Fidelity Oil & Royalty Co. 2-C Sugarland Industries, Josefa Benavides Por. 91, 69 bbl. through ⅛-in. choke, T.P. 400 lb., C.P. 1,140 lb., gas-oil ratio 481, T.D. 4,000 ft.

Chaparosa, Jim Hogg County: Adams, Lucky & Neuhaus 2 T. T. East, El Randado grant, dry at 3,554 ft.

Driscoll, Duval County: Continental 19-B Clara B. Driscoll, S.K.&K. Sur. A-561, 133 bbl. in 13 hr. through 7/32-in. choke, T.P. 65 lb., C.P. 400 lb., gas-oil ratio 163, T.D. 3,920 ft.

Lockhart, Starr County: Sun 1 Marrs McLean, Jose Antonio de la Garza Falcon Por. 80, 128 bbl. jetting, through ⅜-in. choke, 390 lb. working pressure, T.D. 3,636 ft.

Rincon, Starr County: Continental 5-D M. M. Garcia, Sur. 907, A-844, O.W.W.O., on 12-hr. potential test flowed 49 bbl. through ⅞-in. choke, T.P. 1,080 lb., S.I. C.P. 1,360 lb., gas-oil ratio 5,218, perf. 3,888½-91½ ft., old T.D. 3,892 ft., new P.B. T.D. 3,891½ ft.

Ulrich, Starr County: Fidelity Oil & Royalty Co. 2-C Sugarland Industries, Por. 91, A-41, 69 bbl. through ⅛-in. choke, T.P. 400 lb., S.I. C.P. 1,140 lb., gas-oil ratio 481, perf. 3,942-58 ft., T.D. 4,000 ft., P.B. 3,979 ft.

Wade City, Jim Wells County: Smith & Mosser 1 William Ehlers, G. J. Reynolds Sur., A-394, 10,000,000 cu. ft. gas through ⅛-in. choke, T.P. 1,310 lb., C.P. 1,440 lb., S.I. T.P. and C.P. 1,450 lb., perf. 3,437-45 ft., T.D. 5,029 ft., P.B. 3,460 ft.

Yaeger, Jim Hogg County: M. L. Massingill 2 H. C. Yaeger, 4 mi. SW of Hebbronville, dry at 3,871 ft.

Yturria, Starr County: Sun 1-B Yturria Land & Livestock Co., Ygnacio Travino Por. 100, location abandoned.

TEXAS GULF COAST

Jefferson and Fort Bend Counties Most Active Areas

HOUSTON, Tex.—With seven wildcat operations either staked or in some stage of mechanical progress, Jefferson County presented a busy scene this week. Two new locations were spotted. One was Glenn H. McCarthy, Inc., et al 1 McFaddin Trust, 4 miles south of Hampshire. The other was Texas Co. S. D. Barnes et al, a mile southeast of Fannett, a projected 9,500-ft. test. McCarthy's 1 Hebert Trust, 4 miles southwest of Viterbo, which suffered severe damage from a blowout last May, has the hole clean to approximately 7,600 ft. and last week was washing over the 3-in. drill stem at that depth. Total depth at the time of the blowout was 10,092 ft. Texas Co. 1 J. E. Broussard et al was drilling at 8,353 ft. in shale.

Fort Bend County, too, was an active wildcat area, with six operations listed. New locations staked or drilling included Phillips Petroleum Co. 3 E. M. Robinson, in the Blue Ridge field area; Northern Ordnance, Inc., 1 Marrow, in the J. McKnight Survey, and Humble Oil & Refining Co. 1-C Sugarland Industries, on the north flank of the Sugarland dome. Ray Ranger and Jack W. Frazier 1 E. C. Burney estate, 3½ miles southwest of Katy, was shut down for repairs at 7,590 ft. It topped the Ceratobulimina at 7,498 ft. Pure Oil Co. 1 A. C. Woods, 2¼ miles northeast of Fresno, was at 1,650 ft. in sand and shale. O. W. Killam Co. 1 J. R. Nesbitt, 1½ miles northwest of Fulshear, was drilling in hard shale at 6,620 ft.

Brazoria County. — Gulf Oil Corp. staked location last week for a 12,000-ft. test at Allen dome. It is the 1 S. M. Allen et al, in the Sterling McNeil Survey. J. S. Abercrombie and Magnolia Petroleum Co. 1 Corkery, on the west side of the Old Ocean field, is to be dually completed. The total depth is 10,905 ft.

TEXAS GULF COAST COMPLETIONS

Wildcats

Chambers County: Wynn Crosby Drilling Co. et al 1 J. E. Jackson, 15 mi. S of Anahuac, flowed at rate of 806,000 cu. ft. sweet gas and 48 bbl. distillate, T.P. 2,800 lb., S.I. C.P. 2,910 lb., gas-oil ratio 16,850, computed open flow 200,000,000 cu. ft. gas, perf. 8,102-8 ft., T.D. 9,512 ft., P.B. 8,108 ft. Discovery.

Jackson County: Morris Wommack et al 1 Frank Sheblock, 2 mi. SW of Mustang Creek field, dry at 7,012 ft.

Fields

Barbers Hill, Chambers County: Sun 4 Higgins, William Bloodgood Sur., A-5, O.W.D.D., 465 bbl. through ⅞-in. choke, T.P. 700 lb., gas-oil ratio 374, old T.D. 3,805 ft., new T.D. in second sidetracked hole 5,763 ft.

Texas Gulf Producing Co. 2 J. F. Wilburn, O.W.W.O., 120 bbl. oil plus 15

(Continued on Page 72)

OKLAHOMA

East Boley Discovery Makes High Potential

THE new East Boley pool, north of the Dill and Cromwell areas, was off to a good start with offsets drilling on the west, northwest and northeast. Chances for development of a major field comparable with those to the south will not be determined until the offsets are proven, since the discovery is bounded by dry holes on the north, within 1 mile, and on the south by small Hunton lime gas wells. These wells all were drilled over the past several years. The immediate picture, however, is bright as the discovery, Midco Oil Corp. 1 Cradukes, NE NW NE 24-12n-8e, made the largest flow of oil on potential yet reported this year. The initial flow was given as 2,445 bbl. in 24 hours, accompanied by 3,000,000 cu ft. of gas. The oil is 37-gravity, in the Cromwell sand at 3,486-3,504 ft. After 2-in. tubing was set at 3,481 ft. the well made 868 and 894 bbl. in two 24-hour periods through ¼-in. choke.

Creek County.—An unusually good well for this old settled area, east of the main producing area at Slick, was brought in last week as a flowing well. Glen S. Cole et al 1 Sewell, NW SW SE 27-16n-10e, flowed as high as 120 bbl. of oil an hour in the Dutcher sand at 2,640-46 ft. before being choked down to 50 bbl. At total depth of 2,646 ft., the bit was still in the sand and as soon as additional storage is erected, operators will drill deeper.

Garvin County.—The trend of the Pauls Valley pool took a new direction last week when E. J. Kubat 1 Patchell, NW SW 30-4n-1e, flowed 71 bbl. of oil an hour in Pennsylvanian sand at 3,905-4,115 ft., to extend the northern part of the field ¼ mile to the northeast. There is considerable activity in the field. On the east, Stanolind 1 Cashion, NW NE SE 31-4n-1e, was nearing completion after setting pipe on bottom at 4,216 ft. Pure Oil Co. was starting work on their 1 Jackson-Teter-Cashion unit in SE NE SE 31-4n-1e, extreme eastern edge of the field.

OKLAHOMA COMPLETIONS

Wildcats

Logan County: Big Chief Drlg. 1 Jones, NE NE 4-16n-1e, dry, T.D. 5,270 ft., Hunton 4,830 ft., Viola 5,060 ft., Wilcox 5,130 ft., second Wilcox 5,245 ft.

Okfuskee County: Midco Oil Corp. 1 Cradukes, NE NW NE 24-12n-8e, flowed 2,445 bbl. in 24 hr., 3,000,000 cu. ft. gas, Cromwell 3,486-3,504 ft.

McIntyre et al 1 Martin, NW SE 12-12n-8e, dry, T.D. 4,191 ft., Bartlesville 2,985 ft., Hunton 3,995 ft., Viola 4,111 ft., Wilcox 4,156 ft., second Wilcox 4,178 ft.

Amerada 1 Kennedy, SE NE NW 27-12n-10e, dry, T.D. 3,891 ft., Booch 2,550 ft., Hunton 3,595 ft., Viola 3,725 ft., Wilcox 3,770 ft.

Pottawatomie, ¾ mi. NE of Centerpoint: Smith Bros. 1 Coons, NW SW SE 32-10n-3e, dry, T.D. 5,536 ft., Mayes 5,035 ft., Hunton 5,240 ft., Viola 5,400 ft., dolomite 5,493 ft., recovered 60 ft. oily mud, Wilcox 5,532 ft.

Fields

Burbank, Osage County: Magnolia 11, SW SW NE 11-26n-6e, pumped 10 bbl., Bartlesville 2,782-2,845 ft., T.D. 2,852 ft.

Cushing, Creek County: Sinclair Prairie 31 Yarhola, W½ E½ NE 8-17n-7e, dry, T.D. 2,682 ft.

Garrett, Kay County: Ingling & Parker 1 Blazer, SE SW SW 30-27n-2e, pumped 4 bbl., Stalnaker 2,455-91 ft.

Hoyt-Chandler, Lincoln County: Great Lakes Carbon 1 Westover, NW SE SE 3-14n-3e, pumped 30 bbl., Bartlesville 4,403-10 ft., T.D. 5,176 ft.

Isom Springs, Marshall County: Ellis-Winana 2 Snell, 31-7s-6e, pumped 8 bbl., T.D. 539 ft.

Gill-Morse 1 Adams, SE NE SW 31-7s-6e, pumped 7 bbl., T.D. 539 ft.

Loco, Stephens County: Sam and Pauline Raizen 2 Dilley, NW SW SE 6-3s-5w, flowed 240 bbl. in 12 hr., sand 1,052-1,200 ft.

Jackson Bros. 4-C Dilley, SW NE NE 7-3s-5w, flowed 125 bbl., sand 1,070-1,113 ft., T.D. 1,172 ft.

Otoe City, Noble County: Superior 2 Robedeaux, W½ NW NE 21-22n-1e, dry, T.D. 3,427 ft., Layton 3,405 ft.

Ripley, Payne County: Olson Oil 1 Blank, NW SW NW 4-17n-4e, dry, T.D. 4,203 ft., Viola 4,070 ft.

Seminole, Seminole County: Wood Oil 1 Community, NE NE 2-8n-6e, pumped 45 bbl., Wilcox dolomite 4,065-4a138 ft.

Miscellaneous

Carter County: Robinson 1-B Luke, NW NW SW 9-1s-2w, dry, T.D. 285 ft.

Creek County: L. B. Jackson 1 Salesman, NE NW 29-17n-11e, pumped 4 bbl., Skinner 2,001-41 ft.

Haskell County: L. S. Grimm 1 Oskin, SW NE 10-9n-18e, dry, T.D. 1,402 ft.

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Muskogee County: Howard-Castleman 1-A Napier, NE NE SE 32-15n-15e, dry, T.D. 1,373 ft.

Okmulgee County: Ed Walker 1-A Reynolds, NE NW SW 16-13n-12e, pumped 4 bbl., Dutcher 2,000-12 ft., T.D. 2,278 ft.

Sooner Oil & Gas 3 Bovaird, W½ NW SE 21-16n-11e, dry, T.D. 2,209 ft.

Osage County: Anderson-Prichard No. 3, SE SW 32-28n-8e, flowed 31 bbl., pay 2,505-10 ft.

Ross Oil No. 15, NE NW SW 14-29n-11e, pumped 40 bbl., pay 1,015-74 ft.

APPALACHIAN FIELDS

Beaver County Test Near Top of Onondaga

PITTSBURGH, Pa.—In Ohio Township, South Penn Oil Co. is about on top of the Onondaga lime in the Oriskany test on the Cunningham-Vlatovich unit and drilling at 4,620 ft. Several gas pockets were encountered in the Marcellus.

Fayette County. — On Chestnut Ridge in South Union Township, the test of the Peoples Natural Gas Co. on the Walters farm is drilling at 7,841 ft. after cementing back from 7,850 ft. This is 194 ft. in the Onondaga chert and no gas has been found. In the original hole in the Onondaga, there was gas at 7,791 ft. which is coming in the hole and is now reduced to about 100,000 cu. ft. South in Wharton Township, Greensboro Gas Co. is drilling 4 Barton at 3,270 ft. and will shut down to replace the cable.

SW. PENNSYLVANIA COMPLETIONS

Armstrong County, Burrell Township: Carnegie Natural Gas Co. 5 C. K. Slease, 62,000 cu. ft. gas, sand 2,766-78 ft., gas 2,776 ft., T.D. 3,262 ft.

Clarion County, Porter Township: B. Burns et al Wm. Sherman, 40,000 cu. ft. gas, Speechley sand, T.D. 2,666 ft.

Greene County, Center Township; Manufacturers Light & Heat Co. 2 Francis Stewart, dry, through Bayard sand, T.D. 3,307 ft.

Franklin Township: Waynesburg Home Gas Co. 1 Charles Tennant, 298,000 cu. ft. gas, Fifty Foot sand 2,585 ft.; gas 2,620 ft., T.D. 2,645 ft.

Monongahela Township: E. C. Metzler et al E. P. Smith, 419,000 cu. ft. gas, Big Injun 1,678 ft., gas 1,780-85 ft., T.D. 1,787 ft.

WEST VIRGINIA

Boone County.—In Peytona district, Owens, Libby-Owens Gas Department is drilling at 5,103 ft. in the 21 Bull Creek Coal Land Co. or 520 ft. below the base of the Oriskany sand. In two previous wells the Newburg had gas in commercial volume.

It will be several weeks before the Oriskany tests drilling in Gilmer County, Wirt County and Wood County reach a critical depth.

WEST VIRGINIA COMPLETIONS

Braxton County, Birch district: Pittsburgh & West Virginia Gas Co. 7944 John Stump, 313,000 cu. ft. gas, Salt sand, T.D. 1,431 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co., 7914 Elk River C. & L. Co., 149,000 cu. ft. gas, Big Injun sand, T.D. 1,801 ft.

Pittsburgh & West Virginia Gas Co. 7940 Arnold Shafer, 86,000 cu. ft. gas, Injun sand, T.D. 2,017 ft.

Pleasant district: E. L. & C. G. Osborne 1 Betty Mullins, 33,000 cu. ft. gas before shot, Injun sand, T.D. 2,202 ft.

Union district: Southeastern Gas Co. 799 Porters Creek C. & L. Co., 135,000 cu. ft. gas, Big Injun sand, T.D. 2,170 ft.

Doddridge County, Grant district: Braden & Creighton 1271 J. H. Smit, drilled deeper, 49,000 cu. ft. gas, Gordon sand, T.D. 2,922 ft.

West Union district: Edmond Tate 1 Olivia Jones, 315,000 cu. ft. gas, Injun sand, T.D. 1,836 ft.

Gilmer County, Center district: Pittsburgh & West Virginia Gas Co. 7945 C. N. Snodgrass, 180,000 cu. ft. gas, Big Injun sand, T.D. 2,263 ft.

Carnegie Natural Gas Co. 1 Lenora Bell Sturm, 700,000 cu. ft. gas, Salt sand, T.D. 1,442 ft.

Troy district: McArthur Oil & Gas Co. 1 T. H. Bush, dry, through Big Injun sand, T.D. 1,780 ft.

Harrison County, Eagle district: Hope Natural Gas Co. 2448 T. V. Wright, drilled deeper, 113,400 cu. ft. gas, Gordon Stray sand, T.D. 2,168 ft.

Kanawha County, Union district: Shale Gas Co. 1 D. M. Casdorph, 60,000 cu. ft. gas, shot in Brown shale 3,359-3,887 ft., T.D. 3,930 ft.

Lincoln County, Jefferson district: Huntington Development Co. H299 fee, 29,804 cu. ft. gas, Big lime 1,510 ft., Injun 1,715 ft., Berea 2,206 ft., T.D. 2,226 ft.

Laurel Hill district: United Fuel Gas Co. 5230 Huntington Dev. Gas Co., 146,000 cu. ft. gas, Big lime 1,542 ft., Injun 1,751 ft., Berea 2,283 ft., gas in Brown shale, T.D. 3,503 ft.

Mingo County, Warfield district: E. H. Yates 2 George Workman, 1 bbl., hole filled back to 949 ft. and shot, one string left in hole.

Logan County, Logan district: O. B. Cunningham 1 Manley Coal Co., dry, Big lime 1,665 ft., Injun 1,832 ft., Berea 2,366 ft., T.D. 2,389 ft.

Putnam County, Curry district: Dennis M. Roy 1 D. B. Taylor, 146,000 cu. ft. gas after shot, Berea, T.D. 2,162 ft.

Freeman Gas Co. 1 Nancy A. Caldwell, 21,000 cu. ft. gas, Berea, T.D. 2,114 ft.

Ritchie County, Clay district: Pittsburgh & West Virginia Gas Co. 6136 John P. Thomas, 6 bbl., formerly dry through Injun sand and plugged back to Maxton sand and shot 1,621-66 ft., T.D. 1,960 ft.

Wetzel County, Church district: Manufacturers Light & Heat Co. 1 S. S. Teagarden, 30,000 cu. ft. gas, Fourth sand, T.D. 3,461 ft.

Wood County, Union district: Waverly Oil & Gas Co. 1 Clark Lemley, 4 bbl., Berea, T.D. 2,150 ft.

Wyoming County, Ocean district: Godfrey L. Cabot, Inc., 1078 Watts Land Co., through Big lime to 3,092 ft. and will plug.

ORISKANY GAS FIELDS

Jackson County, Ripley district: United Fuel Gas Co. 5120 J. B. Shinn, 6,367,000 cu. ft. gas before shot, Corniferous lime 4,960 ft., Oriskany 5,063 ft., gas 5,070-81 ft., R.P. 1,075 lb. 48 hr., T.D. 5,084 ft.

Texas Gulf Coast

(Continued from Page 70)

per cent salt water on gas lift, input pressure 450 lb., perf. 4,767-97 ft., old T.D. 5,524 ft., new P.B. T.D. 4,800 ft.

Bay City, Matagorda County: Sun 2 E. L. McDonald, J. Betts Sur., A-7, 42 bbl. on gas lift, perf. 7,765-77 ft., T.D. 8,803 ft.

Camp Eleven, Tyler County: American Republic Corp. et al 4-E Cushing fee, T. Cushing Sur., A-14, dry at 8,045 ft.

League City, Galveston County: Phillips 2 Louis G. Lobit, Perry & Austin Sur., O.W.W.O., dual completion; from perf. 9,234-38 ft. 185 bbl. through ⅛-in. choke, T.P. 2,225 lb., gas-oil ratio 1,297; from perf. 9,088-93 ft., 206 bbl. through ⅛-in. choke, C.P. 1,350 lb., gas-oil ratio 901; old T.D. 10,427 ft., new P.B. T.D. 9,341 ft.

Mayo, Jackson County: Louis Crouch 2 A. C. Rodesney, J. R. Rambo Sur., 60 bbl. oil plus 15 per cent salt water, through ⅛-in. choke, T.P. 150 lb., C.P. 720 lb., perf. 5,468-72 ft., T.D. 5,625 ft., P.B. 5,491 ft.

Millican, Brazos County: Phillips 2 Fannie Schoepps, E. M. Millican Sur., dry at 3,493 ft.

North La Ward, Jackson County: Sun 2 O. E. Hackbarth, 120 bbl. through 7/64-in. choke, T.P. 300 lb., perf. 5,210-15 ft., T.D. 5,219 ft., P.B. 5,217 ft.

California Fields

(Continued from Page 65)

structure. Present plans contemplate opening the Newport tidelands for development but the limitations imposed make it almost impossible to deviate a shallow well to such an extent that the present sand can be reached beneath the tidelands.

LOS ANGELES BASIN COMPLETIONS

Coyote, East, Orange County: Graham & Loftus 6 Perkins, 13-3s-10w, pumped 50 bbl. net, 18.2-gravity, 35 per cent cut, T.D. 4,266 ft., P.B. 4,175 ft., perf. 3,995-4,175 ft., completed in Anaheim zone of Pliocene age.

Wilmington, Los Angeles County: Long Beach Oil Development Co. 43-W, 10-5s-13w, flowed 301 bbl., 16.1-gravity, 0.1 per cent cut, 30,000 cu. ft. gas, 38/64-in. bean, pressures 220/600 lb., T.D. 2,925 ft., gravel-packed perf. 2,611-2,921 ft., completed in Ranger zone of Pliocene age.

Union Pacific Railroad 219 Harbor, 4-5s-13w, flowed 28 bbl., 31.3-gravity, 0.7 per cent cut, T.D. 4,399 ft., P.B. 4,245 ft., perf. 4,033-4,239 ft., completed in Terminal zone of Miocene age.

COASTAL DISTRICT

Santa Barbara County. — General Petroleum Corp. has developed some of the heavy-tar production in the Zaca Creek district that was originally found several months ago by Tide Water Associated Oil Co. The commercial significance of this tar accumulation remains to be seen as it is necessary to circulate distillate in order to reduce the viscosity sufficient enough to permit pumping operations. General Petroleum's 2 Wickenden in 24-8n-32w is pumping approximately 50 bbl. daily including circulating oil which was injected at the rate of 1 bbl. per hour. This heavy tarry mass, which shows an average gravity of about 9° A.P.I., would make an excellent asphalt or road oil but it would take so much gas oil to put it in the range of fuel oil that the cost would be almost prohibitive. General Petroleum drilled 2 Wickenden to 5,189 ft. but has plugged the hole to 4,125 ft. from which depth it is producing. In the Los Alamos district, the Whittier Associates are drilling ahead in 1 Barham at 2,948 ft. in a fractured shale showing some oil. Top of the Miocene was placed at 2,470 ft. and drilling operations have been slowed up due to lack of sufficient water.

KANSAS

Operators Trying to Kill Gas at Barton County Well

COMPLETION tests were delayed by gas at the new Barton County discovery, Edouard Jonas 1 Ames, a wildcat in the SE SW SE 22-18-11w. However, a temporary potential was given the well, flowing, of 287 bbl. The well was drilled to 3,328 ft. but perforated at 3,042-49 ft. after plugging back to 3,145 ft. Two acid treatments resulted in a flow of 110 bbl. of 46-gravity oil in 4 hours and on later tests it averaged 27 bbl. of oil, with no water, an hour. Pay zone is the Kansas City lime. At the end of the week operators were still trying to kill the gas, after which another potential will be taken.

Kansas oil activity was up last week. There were 39 new tests reported in 17 counties, compared with 33 first reports the previous week. Russell County led in new wells with nine getting under way.

KANSAS COMPLETIONS

Wildcats

Cowley County: Creekmore & Rooney 1 Snyder, SW SW NE 7-33-4e, dry, T.D. 2,254 ft.

Wolf Creek Oil Co. 1 Cloud, NE ½ NE NW 12-31-4e, dry, T.D. 3,048 ft., Mississippi lime 2,957 ft.

B. B. Blair 1 Jarvis, N½ NE SW 31-32-3e, dry, T.D. 3,602 ft., Mississippi lime 3,191 ft., Arbuckle 3,585 ft.

Leavenworth County: McLaughlin 1 Deitrich, NE NW 34-8-20e, dry, T.D. 1,586 ft.

Marion County: Sunray and Mabee 1 Fast, SE SW NW 7-21-1e, dry, T.D. 3,623 ft., chat 2,968 ft., Hunton 3,400 ft., Viola 3,488 ft., Simpson 3,524 ft., Arbuckle 3,593 ft., porosity but no shows 3,593-96 ft.

Morris County: Derby Oil 1 Glantz, SW NW SE 30-16-5e, dry, T.D. 2,320 ft., Lansing 1,718 ft., Mississippi lime 2,254 ft., porosity with no shows 2,282-2,308 ft.

Ness County: Magnolia 1 Olson, SE SW SE 33-17-25w, swabbed 20 bbl. oil an hr., echo potential 808 bbl. oil and 610 bbl. water, Mississippi lime 4,267-89 ft., T.D. 4,293 ft.

Phillips County: Barnett Drlg. 1 Rundle, NW NW 18-5-19w, dry, T.D. 3,749 ft., Lansing 3,286 ft., Arbuckle 3,655 ft.

Rooks County: Cities Service 1 Stahl, NW NW SW 12-9-18w, dry, T.D. 3,616 ft., Lansing 3,237 ft., Arbuckle 3,586 ft.

Saline County: Phil-Han and Phillips 1 Bailey, SE SE SW 17-15-1w, dry, T.D. 3,485 ft., Hunton 3,097 ft., Viola 3,294 ft., Simpson 3,370 ft., Arbuckle 3,455 ft.

Auto-Ordnance 1 Blomberg, SW SE SE 12-16-4w, dry, T.D. 3,760 ft., chat 2,986 ft., Viola 3,514 ft., Arbuckle 3,736 ft.

Fields

Bitikofer, McPherson County: E. B. Shawver 2 Voth, NW NW SE 1-20-1w, pumped 60 bbl., Mississippian chat 2,894-2,916 ft., T.D. 2,918 ft.

Carmi, Pratt County: Magnolia 4 Binger, SW NW NE 31-26-12w, flowed 480 bbl. in 16 hr. through 1-in. choke, Arbuckle 4,283-4,306 ft.

Shell 1 Sittner, SW SE SE 30-26-12w, flowed 43 bbl. an hr., Arbuckle 4,289-4,316 ft.

Mid-Continent 3 Knop, SW SW NE 25-26-13w, pumped 235 bbl., Arbuckle 4,315-34 ft.

Frog Hollow, Cowley County: I. W. Murfin 1 Cavit, NW SW SE 9-32-5e, dry, T.D. 3,638 ft., Arbuckle 3,626 ft.

Iuka, Pratt County: Skelly 1-B Helmke, SW SW NE 7-27-12w, flowed 178 bbl., Simpson 4-225-40 ft.

Kraft-Prusa, Barton County: Magnolia 4 Grosshardt, NE SW 9-17-11w, pumped 24 bbl., Arbuckle 3,291-99 ft.

Winkler-Koch 1 Burmeister, SE NE 2-17-11w, dry, T.D. 3,422 ft., Arbuckle 3,410 ft.

Laton, Rooks County: Vickers Pet. 2 Gamble, NW NW 3-9-16w, pumped 60 bbl., Kansas City 3,137-68 ft.

Lindsborg, McPherson County: Winkler-Koch 2 Bean, NE NW 25-17-4w, potential 3,000 bbl., Viola 3,397-3,405 ft.

Roxbury S, McPherson County: Westgate-Greenland 1 Bishop, S½ SE NE 30-17-1w, pumped 64 bbl., Mississippian chat 2,676-88 ft.

Silica, Rice County: Vickers Pet. 3-B Rose, N½ SW NE 19-20-10w, pumped 148 bbl., Lansing 3,091-3,100 ft., T.D. 3,342 ft.

Vickers Pet. 1-C Rose, NW SE 19-20-10w, pumped 77 bbl., Arbuckle 3,294-98 ft.

Stormfeltz & Hyde 1 Burden, N½ SE NE 9-20-10w, dry, T.D. 3,320 ft., Lansing 3,095 ft.

Trapp, Russell County: Alpine & Armer 1 Redetzke, NE NE SE 21-15-13w, dry, T.D. 3,381 ft., Arbuckle 3,364 ft.

Vaughn, Russell County: National Ref. 1-B Reinhardt, SE NW SW 19-14-14w, pumped 935 bbl., Lansing 3,000-21 ft.

Zenith-Peace Creek, Stafford County: Transwestern Oil 3 McNickle, SE NW 1-24-11w, pumped 343 bbl., Viola 3,727-47 ft.

J. H. Tatlock 2 Krey, E½ NW NE 1-24-11w, flowed 301 bbl., Viola 3,705-11 ft.

Zenith-Peace Creek, Reno County: Stanolind 1 Ira Johnson, SW SE 31-23-10w, flowed 60 bbl. in 1 hr., potential 985 bbl., Viola 3,709-19 ft.

NEBRASKA

ST. JOSEPH, Mo.—Nebraska Producing & Refining Co. has drilled below 1,600 ft. at 1 Wilkinson in SW SW 3-1n-14e, Richardson County, Nebraska, in the Dawson oil pool. The company's recently drilled 1 D. E. Bohrer, one location south in C E½ NW NW 10-1n-14e, produced 155 bbl. of oil in a 24-hour pumping test. This is the only producer drilled in this year in Nebraska.

J. O. Isaacs is drilling deeper the old 1 Schrader-Hass in C NW SE 29-9s-20e, Jefferson County, Kansas. This was drilled originally by E. V. Jackson and abandoned at 1,552 ft. There had been 74 ft. of heavy oil in the hole, which was shot with 80 qt. from 1,511 to 1,541 ft.

J. O. Isaacs has a new location at 1 Casebier in SE SW SW 22-10s-19e, Jefferson County. Dan McLaughlin has a new location at 1 Union Central in C NE NE 8-10s-21e, Leavenworth County. McLaughlin 1 Dietrich in C NE NW 34-8s-20e, Leavenworth County, Kansas, was dry and abandoned at 1,586 ft., total depth.

CANADIAN FIELDS

Turner Valley Extension Well Looks Like Major Producer

CHATHAM, Ont.—In North Turner Valley Extension, British Dominion 5, LSD 5, 17-21-3w5, ¼ mile north of the previous most northerly producer, looks like one of the biggest wells in the field. Finished at 8,598 ft. with Madison limestone at 8,169 ft., the well, after acidizing, made 150 bbl. an hour from the lower porous and 60 bbl. from the upper porous, and has removed packer for a combined test.

In the west central area, Devonian Test 1, LSD 2, 25-19-3w5, plugged back to test the Madison limestone after faulting from Banff shales to Blairmore formation at 8,978 ft., developed an initial production of 350 bbl. daily after acidizing and is being finished as a Madison producer.

In the southwest extension, Brown Oil Corp. 6, LSD 15, 5-18-2w5, which halted drilling at 8,588 ft. after getting the Madison at 8,458 ft. indicated a small producer from the first zone of the upper porous lime, and has been deepened to 8,650 ft. for a test of the second zone of the upper porous.

Del Bonita.—Pacific Oil & Refining Co. is enlarging the former Huff refinery at Calgary to 1,500 bbl. daily capacity, with a new pipe still and fractionating tower, additional storage tanks and automatic controls. British-American Oil Co. has contracted for the entire output of gasoline, diesel oil and distillates.

Athabaska.—In the Athabaska district, northern Alberta, Deca 2, LSD 3, 16-66-23w4, encountered oil showings higher than expected in what appears to be a stray sand, from 1,654 to 1,662 ft. Drilling continued through shale to 1,674 ft. when the Grand Rapids sandstone was cored for 12 ft., of which 2½ ft. showed heavy saturation in a coarse sand. Casing was cemented to 1,674 ft. after which the plug was drilled out for the first of a series of joint tests by East Crest Oil Co. and Davies Petroleum.

Watson structure.—Gulf Research & Development Co., which last year started a program of preliminary surveys in Alberta, has secured reservation of 49,852 acres in the southern Alberta foothills. The acreage, in Townships 7 to 10, Ranges 1 and 2w5, extends from the Porcupine Hills to below the Crow's Nest Pass Railway, taking in part of the Watson structure as well as a parallel fold to the east. A preliminary survey of the area in 1942 will likely be followed this year by a seismograph survey.

Pouce Coupe.—In the northwestern Alberta foothills, W. Wilson has finished a large gasser for the Alaska Highway Oil & Gas Co. near Pouce Coupe. Gas was struck in substantial quantities at 2,168 ft. Location is 25 miles northeast of Pouce Coupe and about the same distance southeast of

(Continued on Page 80)

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OHIO, KENTUCKY

Two Wells Extend Ohio Producing Areas

ZANESVILLE, Ohio.—The Clayton pool continues to expand. Preston Oil Co. completed a well on the Rachel Amerine tract in the SE Section 9, having an initial production of 207 bbl., extending the pool ¼ mile to the southeast. The same company is testing a well in Section 5 on the Lovebery farm, which looks good for better than 200 bbl., and extending the pool a location to the northwest. Preston Oil is also testing a well in Section 12, Reading Township, on the Maddon farm which looks like about 250 bbl., extending the pool a location to the southwest. An inside location on the Yarger tract made 81 bbl.

The Wheeling Oriskany pool was extended ½ mile to the west by the Johnson well in Section 20. The well made 1,800,000 cu. ft. with a rock pressure of 1,135 lb. Another nice well was completed on the Cole tract in the Columbia Station pool, Lorain County, good for 3,720,000 cu. ft. from the Clinton sand at 2,629-45 ft.

OHIO COMPLETIONS

Ashland County, Jackson Township: Hoddle et al 2 McFadden, Sec. 27, Berea, 5 bbl., T.D. 635 ft.

Athens County, York Township: Ohio Fuel 229 Sunday Cr. C. Co., Sec. 29, Berea, 637,000 cu. ft., T.D. 941 ft.

Coshocton County, Pike Township: Blackburn et al 2 Nora Gault, Sec. 5, Clinton, 12 bbl. and 250,000 cu. ft., T.D. 3,183 ft.

Guernsey County, Wheeling Township: Ohio Fuel 1 G. W. Johnson, Sec. 20, Oriskany, 1,800,000 cu. ft., T.D. 3,497 ft.

Hocking County, Ward Township: Preston Oil 225 Sunday Cr. C. Co., Sec. 10, Clinton, 22 bbl., T.D. 3,359 ft.

Holmes County, Killbuck Township: Ohio Fuel 1 J. D. Duncan, Sec. 13, Clinton, dry, T.D. 3,661 ft.

Lorain County, Columbia Township: Ohio Fuel 1 Jennie Cole, Lot 84, Clinton, 3,720,000 cu. ft., T.D. 2,647 ft.

Wellington Township: Ohio Fuel 2 G. A. Gott, Lot 7, Clinton, dry, T.D. 2,382 ft.

Monroe County, Franklin Township: C. Cristy 1 Edith McVey, Sec. 8, Keener, dry, T.D. 1,275 ft.

Morgan County, York Township: Industrial Gas 3 C. A. Stoneburner, Sec. 19, Berea, dry, T.D. 1,250 ft.

Muskingum County, Blue Rock Township: Industrial Gas 4 U. S. A., Sec. 9, Clinton, 200,000 cu. ft., T.D. 4,476 ft.

Industrial Gas 3 H. S. Barricklow, Sec. 9, Clinton, 400,000 cu. ft., T.D. 4,357 ft.

Perry County, Clayton Township: Preston Oil 2 Mary A. Yarger, Sec. 4, Clinton, 81 bbl., T.D. 3,404 ft.

Preston Oil 2 E. E. Amerine, Sec. 9, Clinton, 207 bbl., T.D. 3,395 ft.

Palm Oil 5 New Pery Coal Co., Sec. 9, Clinton, dry, T.D. 3,381 ft.

Summit County, Boston Township: William Dempsey 1 Hulda Mayer, Lot 7, Newburg, dry, T.D. 3,090 ft.

Richfield Township: Wiser Oil 1 Stauffer est., Lot 15, Oriskany, dry, T.D. 2,130 ft.

Washington County, Liberty Township: Burkhart O. & G. 6 Charles W. Hall, Sec. 4, Injun, dry, T.D. 1,665 ft. (drilled deeper).

Wayne County, Plain Township: Clark et al 1 E. W. Wood, Sec. 21, Clinton, dry, T.D. 3,269 ft.

WESTERN KENTUCKY

OWENSBORO, Ky.—B. B. Hamilton appears to have opened a pool 2½ miles northwest of Seebree in Union County in 1 Sellera in Tar Springs sand at 1,872-92 ft. The well flowed oil on a 1-hour drill-stem test, flowing into pits for 5 minutes.

Carter Oil Co. 2 C. E. Cottingham, in Henderson County, looked like a dry hole as it found no Benoist sand. It was drilling at 2,625 ft., with Ste. Genevieve lime penetrated from its top of 2,533 ft.

WESTERN KENTUCKY COMPLETIONS

Henderson County: Milo B. Siegel, 4 C. A. Demplewolf, dry at 1,380 ft.

Sinclair Prairie 2 O. Bradley, pumped 58 bbl. oil, 10 bbl. water, McClosky lime at 2,688-95 ft., T.D. 2,769 ft.

Carter Oil 1 DeVasier, a wildcat, in the Robards area. Opened the Green Briar pool. Pumped 114 bbl. in 24 hr. McClosky lime 2,498-2,505 ft. T.D. 2,655 ft.

Carter Oil 1 Susanna Gates, pumped 49 bbl., McClosky lime 2,554-57 ft., T.D. 2,620 ft.

Farm Bureau 2 Sand Island, a wildcat, dry at 2,708 ft., Menard 1,810 ft., Glen Dean 2,092 ft., Barlow 2,230-36 ft., Cypress 2,394 ft., Renault 2,540 ft., Ste. Genevieve 2,540 ft.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, District Land Office, Salt Lake City, Utah. Notice is hereby given that the lands herein described within the known geologic structure of the Cisco Dome Gas Field, Utah, are offered to qualified bidders of the highest amounts offered per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act, as amended by the act of August 21, 1935 (49 Stat. 674, 30 U.S.C. 226) at a sale to be held in the United States Land Office at Salt Lake City, Utah, at 10 a.m., August 26, 1943, in the following units: Parcel No. 1, T. 20 S., R. 21 E., sec. 3, lots 1, 2, S½NE¼, SE¼; sec. 10, E½. Parcel No. 2, T. 20 S., R. 21 E., sec. 3, lots 3, 4, S½NW¼, SW¼; sec. 10, W½. Parcel No. 3, T. 20 S., R. 21 E., sec. 4, SE¼NE¼, NE¼SE¼, S½SE¼; sec. 9, E½. Parcel No. 4, T. 20 S., R. 22 E., sec. 20, W½SE¼; sec. 29, E½. Parcel No. 5, T. 20 S., R. 22 E., sec. 20, SW¼; sec. 29, W½. Parcel No. 6, T. 20 S., R. 22 E., sec. 30, lots 1, 2, 3, 4, E½, E½W½. Parcel No. 7, T. 20 S., R. 21 E., sec. 22, SE¼SW¼; sec. 26, N½, N½SE¼, SE¼SE¼; sec. 27, N½NE¼, SE¼NE¼. Parcel No. 8, T. 20 S., R. 22 E., sec. 31, lots 1, 2, 3, E½, E½NE¼, NE¼SW¼; T. 21 S., R. 22 E., sec. 5, NW¼NW¼ (unsurveyed); sec. 6, NE¼NE¼ (unsurveyed). Each lease will be made subject to the unit plan for the Cisco Dome Unit Area, Utah, approved June 6, 1942. Mimeographed copies of the plan will be available for distribution to parties interested in bidding at the local land office in Salt Lake City, Utah, and offices of the oil and gas leasing division, Geological Survey at Salt Lake City, Utah, Casper, Wyoming, and Washington, D. C. Upon acceptance by the Secretary of the Interior of any bid for the unsurveyed tracts they will be surveyed at Government expense. Each successful bidder must deposit on date of sale with the officer in charge of the sale a certified check on a solvent bank or cash for one-fifth of the amount bid by him and file a showing of qualifications to receive a lease as required by section 7 of Circular 1386. The remainder of the bonus bid and annual rental must be paid prior to the issuance of the lease. Each parcel will be offered for sale separately, but bidders may submit bids for two or more parcels regardless of the acreage involved, since each lease will be made subject to and operated under a prescribed unit plan of development and operation. Bids may also be submitted by mail provided they are accompanied by one-fifth of the bonus bid and a showing of qualifications of the bidder. The envelope must be plainly marked for opening on the day and hour of the sale. Bidders are warned against violation of section 59, United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Scott P. Stewart, Register.

Union County: H. H. Weinert 2 F. Greenwell, 1½ mi. NW of Morganfield, pumped 260 bbl. a day 12 days after it came in as a producer. McClosky lime 2,581-93 ft., T.D. 2,675 ft.

Daviess County: J. C. Ellis 3 Ellis-Vance, in the Utica area, pumped 33 bbl. Cypress sand 1,440-55 ft., T.D. 1,866 ft.

Webster County: Farm Bureau et al 1 S. F. Powell, a wildcat 1 mi. NE of Seebree, 600,000 cu. ft. of gas, Penn sand 745-91 ft., T.D.

EASTERN KENTUCKY

ASHLAND, Ky.—Although a number of wells are believed to be at or near completion levels, reports from eastern Kentucky fields do not include any completed wells this week.

Drilling operations, however, continue to show a slight expansion with a few new locations made in some areas.

INDIANA COMPLETIONS

Gibson County: R. D. Brown 2 Crecelius, NW SW SE 36-1s-10e, pumped 50 bbl., sand 1,330-50 ft., shot.

Vanderburgh County: Illind and Yingling 2 Schutte, SW SE SW 29-6s-11w, pumped 11 bbl. oil, 64 bbl. water in 4 hr., Waltersburg sand 1,810-20 ft., T.D.

W. F. Lacey and Al. Cochran 1 Frank Fickas, SW SW NW 11-7s-10w, dry at 2,386 ft., Menard 1,410 ft., lower Menard 1,477, Vienna 1,540 ft., Tar Springs 1,570 ft., lower Glen Dean 1,658 ft., Hardingsburg 1,710 ft., Golconda 1,800 ft., Barlow 1,933 ft., upper Cypress 1,950 ft., Cypress sand 1,965-2,019 ft., Renard 2,130 ft., no Benoist sand, Ste. Genevieve 2,166 ft., Fredonia 2,234 ft., no McClosky lime.

NORTH LOUISIANA

Mid-Continent Drilling Deep Test Near Jonesboro

SHREVEPORT, La.—While detailed information on the deep test being drilled by Mid-Continent Petroleum Corp. in Jackson Parish was not available, drilling is under way. The objective is reported to be the lower Glen Rose formation, expected between 8,900 and 9,000 ft.

Location of the well, 1 Tremont Lumber Co. in 13-16n-5w, is some 5 miles northeast of Jonesboro and 12 miles southeast of the Driscoll gas-distillate field in Bienville Parish. Production at Driscoll is in the Rodessa and Hosston zones of the lower Glen Rose, between 5,600 and 6,900 ft. It is also 21 miles northeast of the Calvin distillate field of Winn Parish, where production is in the Paluxy at 5,786-94 ft.

NORTH LOUISIANA COMPLETIONS

Wildcat, Catahoula Parish: The California Co. 1 Eckhart, NE NE 12-9n-7e, dry, T.D. 5,860 ft., Wilcox 3,115 ft., Midway 5,820 ft.

Beekman, Morehouse Parish: Union Producing Co. 3-A Crossett, NE NE 5-22n-6e, dry, T.D. 6,225 ft., Wilcox 1,436 ft., Cotton Valley 3,500 ft., lime 6,102 ft.

Pine Island, Caddo Parish: Four Star Oil Co. 5 Muslow, SW NW SW 5-20n-15w, flowed 135 bbl. after acid, T.D. 1,520 ft.

McClenaghan & Clark 5 fee, SW NE SW 18-21n-15w, pumped 25 bbl., T.D. 1,695 ft.

Vivian, Caddo Parish: A. P. Gilbert 2 Thigpen-Herold, SW NW SW 35-22n-16w, dry, T.D. 2,520 ft.

ARKANSAS COMPLETIONS

Wildcats

Logan County, 5 mi. S & W of Booneville: Sooner Drlg. 1 Jack Foster, SE NW 26-5n-28w, dry, T.D. 740 ft.

Nevada County: Placid Oil Co. 1 Bodcaw, SE NW 18-14s-22w, dry, T.D. 7,180 ft., Nacatoch 985 ft., Tokio 1,980 ft., Cotton Valley 4,346 ft., Smackover 5,579 ft., salt 6,115 ft.

Fields

Haynesville, Columbia County: Midstates Oil 2 Beene-Beckett, NW SW 2-20s-20w, flowed 220 bbl. in 12 hr., perf. 5,430-50 ft. in Pettit, T.D. 5,510 ft.

Hillsboro, Union County: Hunt Oil Co. 4 Burnside, SE SE SE 13-18s-14w, pumped 15 bbl., perf. 2,571-74 ft., T.D. 2,578 ft.

Stephens, Columbia County: Lechner & Hill 1 Smart, NW SW NE 14-15s-20w, dry, T.D. 3,470 ft., lower Tokio 2,521 ft.

MISSISSIPPI

JACKSON, Miss. — Unqualified reports that oil has been struck come from the Gulf Refining Co.'s wildcat test on the Alden Davis farm, 16 miles northwest of Waynesboro, in Wayne County. Nothing definite concerning the importance of the oil showings has been made public. An unconfirmed report was to the effect that a 100-ft. oil sand had been penetrated. Active lease buying has started. The 1 Davis is in 2-9n-9w. At latest reports the well was coring around 6,760 ft.

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The Oil and Gas Journal has more paid circulation to Drilling Contractors than any other oil publication.

Among the Drilling Contractors

Dixie Drilling Co., Houston, Tex., is at work on two wells for Texas Co. in the Erath gas-distillate field of Vermilion Parish, Louisiana. One is Erath Unit 35-1; the other, Erath Unit 3-6. Production from these wells will go to the big recycling plant being built in the Erath area by Texas, Humble Oil & Refining Co., Phillips Petroleum Co., and Tide Water Associated Oil Co. Dixie was at 11,535 ft. at 1 Calvert & Todd, which it is drilling for Union Oil Co. of California a mile north of Houma, in Terrebonne Parish.

Southern Drilling & Well Servicing Co., Houston, Tex., has the contract for drilling 3 Robinson-Bashara in the Blue Ridge field of Fort Bend County, Texas, for Phillips Petroleum Co. For the same company Southern was setting the oil string last week at 5 La Ward, in the North La Ward field, Jackson County. This contractor is to drill two wildcat wells for Edwin Neilsen et al, one south of Inez, in Victoria County, and the other south of Lissie, in Wharton County. Each is projected to 7,000 ft.

Rowan Drilling Co., Houston, Tex., is moving in for 1-D State-Trinity Bay in the South Anahuac area of Chambers County, Texas, to be drilled for Standard Oil Co. of Texas. Rowan was at 8,600 ft. last week at 1 Julia Hinz, Esperson dome, Liberty County, which it is drilling for Gulf Oil Corp.

Houston Drilling Corp., Houston, Tex., was moving in last week at 1-D Harmon, which it will drill for Salt Dome Oil Corp. in the Harmon field, Jackson County, Texas. It was preparing for a squeeze job at Tide Water Associated Oil Co. 1 Mauritz, in the North La Ward field, Jackson County. That well is at 5,200 ft.

H. O. Newman, Coleman, Tex., has contract for 3,600 ft. Palo Pinto lime test in Runnels County, Texas, for L. E. Hults 1 C. C. Gray, Block 42, Section 147, E.T. Ry. Survey, near the Beddo pool.

Grey Wolf Drilling Co., Houston, Tex., has started drilling 18 Wilson-Cochran, a north-flank well in the Port Barre field, St. Landry Parish, Louisiana, for Gulf Refining Co. It was at 2,500 ft. at 2 Moos, in La Gloria field, Jim Wells County, Texas, for Texas Co., and it was below 10,200 ft. at 2 Pinehurst, for La Gloria Corp. in the Pinehurst field of Montgomery County, Texas.

Oil Production Maintenance, Inc., Houston, Tex., is making a dual completion at 1 Steele, in the Winnie area of Chambers County, Texas, for Texas Co. It has started a workover at the Humble Oil & Refining Co. 6 Guinne in the Amelia field, Jefferson County. It has the contract also for a workover job at R. Y. Smith Oil Co. 1 Phillips, in the South Houston field, Harris County, Texas.

Dale Smith, Coleman, Tex., contractor, has agreed to drill an Ellenburger test to around 2,200 ft. in Lampasas County, Texas, for Harold Bishop, Texas and Ohio independent producer, who holds approximately 5,600 acres around the location. Drilling started last week on the wildcat test, which is about 12 miles north of Lampasas, in the south central part of the county.

Big Chief Drilling Co. has been awarded contract to drill a wildcat test on the major Hunton lime arch extending through western Oklahoma County, Oklahoma. L. S. Youngblood, independent of Oklahoma City, has staked location for 1 Swatek, in C NW SW 7-11n-4w. Work is to start immediately on the 7,600-ft. test.

Fred Morgan has contract for Sunray Oil and Eason Oil 1 Cather, in NE NW NW 15-16n-2w, Logan County, Oklahoma, on east side of Guthrie townsite. The Wilcox sand is the objective of the test, which was drilling near 2,000 ft.

Crow Drilling Co. has 6,000-ft. contract on H. C. Owens et al 1-A Caddo Levee Board, a wildcat in SE 12-22-16w, Caddo Parish, Louisiana. Crow also has contract on H. L. Carnahan 1 Glassell-North, which has been staked in SE 26-20n-15w, a Travis Peak test.

Parker Drilling Co. has been awarded contract on Midstates Oil 1 Hunt-Lee-Miller, in NW 17-23n-8w, a Pettit

lime test in the Haynesville area, Claiborne Parish, Louisiana.

Manning & Brown have been awarded contract to drill a test to the Tensleep in Little Buffalo Basin in northern Wyoming. Fred Goodstein has entered into a deal with some of the lessees of federal land and will drill an independent test.

M. J. Delaney Co., Dallas, Tex., has been awarded contract to drill a 7,500-ft. wildcat for Hugh W. Stoddard, of Dallas. This will be the 1 R. M. Kendrick, 330 ft. from south and east lines of Section 748, Block D, John H. Gibson Survey, southwestern Yoakum County, Texas. The test will seek pay in the regular Permian horizon of the county at around 5,500 ft.

George Livermore, Inc., has contract to drill Darby Petroleum Co. 1 Harris, Dawson County, Texas, wildcat. The location is 440 ft. out from the southwest corner of Labor 16, League 268, Moore CSL. Contract depth is 5,500 ft. Driller was preparing to spud.

Big West Drilling Co. is rigging up on its rotary on Stanolind Oil & Gas Co. 1 Jarrell, northwest of Bovina, Parmer County, Texas. The outfit was moved in from Louisiana. Depth of the contract is production or granite. Test is located in Section 19 CSL.

Turner Drilling Corp. will drill Franklin Petroleum Development Co. 1 Charles A. Beebe, in C N½ SW NW 34-21n-14w, Manistee County, Michigan.

W. Spencer Cook has the contract to drill the Charles W. Cook and Del Fortney 1 Spaman, in SE SE NE 27-3n-14w, Allegan County, Michigan.

Sprenger Brothers will drill Gulf Refining Co. 1 Edward Clement, in C N½ NW NE 12-14n-4e, Bay County, Michigan.

Ray Sanders will drill Otto Lund 4 Lee Flynn and Grace Flynn, in SE SW SW 14-5s-16w, Cass County, Michigan.

Contractors Attempt to Meet War Conditions

(Continued from Page 12)

Considerable dependence has been placed by war authorities and statisticians on the rigs presently stacked to meet any sudden increase in drilling. However, there are several factors entering into this problem, private conversations with contractors reveal. The first is the stripping of stacked rigs to keep presently operating rigs going. If a jaw clutch is needed about the only place it can be obtained quickly is from a stacked draw works. The same applies to bearings, sprockets and sometimes chains and engines.

The result is a large number of rigs which strictly speaking are not in operating condition and could not be put to drilling without obtaining some items which are currently scarce and apt to get scarcer. Steam rigs, a number of which were stacked for a few years preceding the war due to the advent of the power rig, have been considered a backlog. Here again, the picture is slightly distorted by the omission of the fact that enough boilers to supply steam for approximately 350 rigs have left the oil fields to go into some type of war service.

Aside from the stripping of rigs, the natural deterioration while stacked is an important item. Some of these rigs have been stacked over a year and a half.

The price situation (drilling contract price), which up until recent months was a cause of complaint among drilling contractors, is now favorable. Drilling contractors are refusing work in which there is not sufficient profit to compensate for equipment replacement. Acreage deals, oil payments, etc., are not entirely out but only a few contractors are operating on this basis and they do so because of preference. Most contracts are on a cash basis. Wildcats in dangerous or unknown territory are being taken on day work rather than a contract basis. Generally, oil companies are contacting more contractors than formerly when a contract is to be let.

It appears that if any large increase in petroleum supplies and reserves is to be obtained by drilling, other factors than a favorable price for oil, the finding of oil-bearing structures and the supply of casing and producing equipment must be considered. The manpower and materials supply in the drilling industry as brought out at the meeting of the directors of the drilling contractor association show large in the picture. And getting a lot of stacked rigs into operation, when, as and if, is going to take a bit of doing.

Those attending the meeting included N. H. Wheless, Glenn A. Campbell, Wm. D. McBee, C. J. Paine, A. H. Rowan, C. J. Davidson, George F. McQueen, John Moran, Warren S. Churchill, H. C. Milhoan, J. E. Brantly, J. Zeppa, George P. Livermore, W. B. Powell (representing Howard P. Holmes), F. M. Porter (representing Leslie Fain), and R. U. Maddox (representing Grady Vaughn), R. V. Evridge, C. J. Davidson Drilling Co.; C. D. Smith, McQueen & Clevenger; Hamilton Rogers, Rowan Drilling Co.; Marion Church, attorney for the association; Brad Mills, executive secretary.

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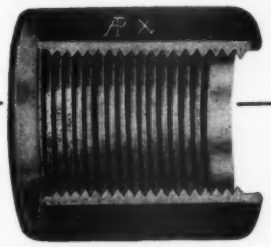

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PERSONALS

O. L. FISHER

Continental Assigns Fisher to Coastal Superintendency

APPOINTMENT of O. L. Fisher to be general superintendent of Continental Oil Co.'s Gulf Coast division, production and drilling department, was announced at the company's general offices in Ponca City, Okla., last week. He succeeds Fred F. Waltermire.

Mr. Fisher joined Continental in 1926 as a cleanout helper in the production department, Texas Panhandle district, and held jobs as tool dresser, clerk, foreman and farm boss.

On October 1, 1935, he was named district superintendent at Basile, La., and April 1, 1941, was promoted to be assistant division superintendent, Houston.

As general superintendent of the Gulf Coast division, Mr. Fisher's headquarters will remain at Houston.

Joe D. Davis has been appointed manager of a Mid-Continent field office opened in Tulsa by Ashland Oil & Refining Co., Ashland, Ky.

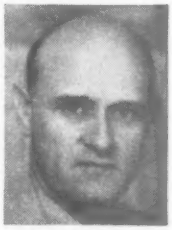
Carl Templeton, scout in the Central Oklahoma area, is now czar of the Shawnee scout check.

P. H. Duval, Longview, Tex., has been promoted to general superintendent of the Arkansas Pipe Line Corp. and will office in Shreveport, La. He will move to Shreveport August 1. For 13 years he was superintendent of the East Texas pipe-line division of Arkansas Fuel Oil Co.

W. H. Stueve, engineer for Oklahoma Gas & Electric Co., Oklahoma City, Okla., has been reappointed a member of the state Board of Registration for Professional Engineers, the first reappointment in the history of the board.

Kermit Murdock has been appointed chief clerk at the Mount Vernon, Ind., western division headquarters for Sohio Producing Co., a subsidiary of Standard Oil Co. (Ohio).

William N. Walker, who formerly had supervision of all field-equipment inventories of Houston Oil Co., Houston, Tex., has been commissioned a second lieutenant after having completed the officers' candidate course at the antiaircraft artillery school at Camp Davis, North Carolina. Lieutenant Walker married Miss Mary Demma, of Houston, on Saturday, June 10.



W. A. MALEY

W. A. Maley, division geologist for Humble Oil & Refining Co. in Corpus Christi, Tex., has been appointed to the board of directors of the Chamber of Commerce in that city. He will serve as chairman of the oil and gas committee and of the special committee created to investigate underground water supplies in the Corpus Christi area. Mr. Maley succeeds **Guy I. Warren,** independent oil operator, who recently was commissioned a lieutenant colonel in the Army Specialists Corps.

Shifts: **E. H. Clingman,** superintendent, Fain Drilling Co., Yorktown to Beeville, Tex.; **J. P. Straight,** superintendent, Cities Service Oil Co., Jennings, La., to Gladewater, Tex.; **R. V. Ewing,** geologist, Continental Oil Co., Portales, N. M., to Morton, Tex.; **C. W. Payne,** geologist, Carter Oil Co., Hartford to Henderson, Ky.

F. M. York has been promoted to production foreman for Shell Oil Co., Inc., in the Wasson district of West Texas. He formerly was head roustabout in the Hobbs, N. M., district. **T. R. Chambers** has been transferred from Wasson to the Eunice district, New Mexico, to serve as head roustabout.

W. N. Finnegan, Jr., executive assistant of Humble Oil & Refining Co., Houston, Tex., has been made chairman of the War Chest drive in Region 3, comprising 21 Texas counties. Mr. Finnegan, who has been with Humble 23 years, served last year as assistant to Harry C. Wiess, president of Humble, who was state campaign chairman for the USO. He has been active in Community Chest and Red Cross activities for years.

First Lt. James L. Rice, formerly in the production accounting department of Humble Oil & Refining Co., Houston, Tex., is in Kennedy General Hospital, Memphis, Tenn., recovering from shell shock, malaria, and jaundice, contracted in fighting the Japanese on Guadalcanal.

Capt. Alvin L. Chapman, formerly in charge of the land department for H. F. Wilcox Oil & Gas Co., Tulsa, has been assigned to the airplane mechanics school of the Army Air Forces Training Command at Gulfport Field, Mississippi. Captain Chapman is a graduate of the Army Ground School, Army Flying School and Army Finance School.

Roy D. Payne, formerly with Coastal Engineering Service in Corpus Christi, Tex., has been commissioned a lieutenant and is at Camp Claiborne, Louisiana.

Staff Sgt. C. D. Chenowith, Borger, Tex., who was associated with Phillips Petroleum Co. for 9 years before joining the Army, has been reported missing in action. The plane on which he was an aerial observer failed to return to its base after the July 4 raid on LeMans, France.

David Scott, Jr., partner in Ryder-Scott Co., oil-producing and engineering concern, addressed the Kiwanis Club of Bradford, Pa., last week, on core-testing operations.

Alexander Fraser, president of the Shell Oil Co., Inc., New York, and **A. J. Galloway,** Houston, Tex., vice president in charge of production in the Gulf Coast, were in Tulsa last week conferring with **R. B. Roark,** vice president in charge of production for the Mid-Continent area.

H. G. Barton has succeeded **Robert C. Patterson** as supervisor, oil and gas operations, California district, U. S. Geological Survey, and **B. H. Murphy** has succeeded Mr. Barton as deputy supervisor, oil and gas operations, in the Taft, Calif., office. Mr. Barton has moved his headquarters from Taft to Los Angeles.

Travis E. Schermerhorn, Shreveport, La., has completed 30 years of service with Carter Oil Co. and was recently presented with a 30-year service button by **William A. Watkins,** southern division superintendent.

C. P. Watson, vice president of Seaboard Oil Co., Los Angeles, Calif., has been appointed to the National Committee on Oil Production, and **C. A. Johnson,** president of Socal Oil & Refining Co. of California, has been appointed to the National Committee on Refining by the Petroleum Industry War Council.

A. C. W. Smith, of Titusville, Pa., has retired after 24 years' service with Brundred Oil Corp., Oil City, Pa. At the time of his retirement he was assistant secretary-treasurer and office manager. He will be succeeded by **Frank E. Lyons,** of Pittsburgh, Pa., who was formerly associated with Benedum & Trees Oil Co.

Arthur H. Boultbee, Shell Oil Co., Inc., has been advanced from technologist at the Wilmington, Calif., refinery to department manager, technical department, and **Samuel B. Thomas,** who has been head of the technical department, has been promoted to department manager, chemical department. Both remain at the Wilmington refinery.

Jack Doyle, president of Doyle Petroleum Co., and independent California oil operator and a national figure in Elkdom, is recuperating from pneumonia and will return to his home from the hospital within the next 10 days.

A. W. Weeks, senior petroleum development analyst of the production division, District 4, PAW, has returned to Denver, Colo., headquarters after being on duty for 3 months in the Washington office.

Thomas A. Dines, president of Utah Oil Refining Co., has been elected chairman of the regional board of governors of the Smaller War Plants Corp. for five Rocky Mountain states with headquarters in Denver, Colo.

Joseph A. Holmes, technical adviser to Standard Oil Co. of Venezuela and previously chief petroleum engineer for the company, has returned to the United States and accepted a commission as a lieutenant colonel in the Army intelligence service. He is stationed at Miami Beach, Fla. Mr. Holmes spent most of the past 18 years in South America, chiefly in engineering work with Lago Petroleum Corp., Standard of Venezuela and Pan American Petroleum & Transport Co.

L. G. Huntley, consulting geologist, and **John Beverly,** formerly with Standard Oil Co. of Venezuela, who recently returned to the United States to join the Navy, were foreign guests last week at the July meeting of the Houston Nomads. **W. V. Vietti,** chief petroleum engineer for the Texas Co., was the principal speaker.

Robert E. Yancey and **Joseph W. Catron** have joined the Ashland Oil & Refining Co. staff at Ashland, Ky., as junior chemical engineers in the refinery operation.

Leonard E. Scott, engineer for United Gas Pipe Line Co., has been transferred from San Antonio to Dallas, Tex.

Charles M. Finley has been promoted to roustabout foreman for United Gas Pipe Line Co. in the Jackson, Miss., district.

A. E. Lacomble, president, Shell Development Co., Emeryville, Calif., has been appointed a member of the advisory panel to the Research and Development Branch, Military Planning Division, Office of the Quartermaster General. His special field will be to advise on questions concerning lubricants, solvents, plastics and synthetic rubber. The panel is composed of 39 nationally known scientists and industrialists, representing nearly every field of research, manufacturing and industry.

Alex Clark, chief geologist of the Shell Oil Co., Inc., in Canada, will leave shortly for Los Angeles, Calif., where he will become assistant to the manager of the exploration department. His place as chief geologist in Alberta will be taken by **L. M. Clark,** formerly in charge of the Shell geological department in Illinois.

Dr. E. H. Simmons has been elected president of Sentinel Oils, Ltd., of Calgary, Alta., succeeding the late J. F. M. Moodie.

William L. Naylor, assistant controller of the Gulf Oil Corp., has been elected president of the Pittsburgh control of the Controllers Institute of America.

Gerald E. McCoy and **Trevor G. Newton,** assistant controllers of the Standard-Vacuum Oil Co., New York, have been elected to membership in the Controllers Institute of America,

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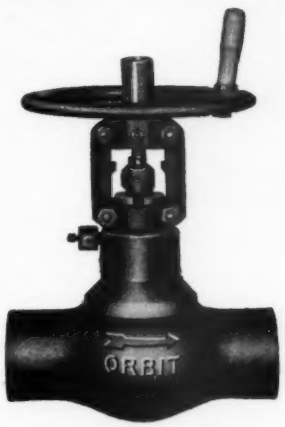

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Since 1912

TULSA, OKLAHOMA

as have **Alexander P. Smith,** vice president and controller of the Guiberson Corp., Dallas, Tex., and **Fero Williams,** assistant secretary and assistant treasurer of the Pacific West Oil Corp., Los Angeles. The institute is a technical and professional organization of controllers devoted to improvement of controllership procedure.

L. N. Hagood, Casper, Wyo., was rewarded recently for 20 years of persistent effort to explore the Douglas Creek structure in Rio Blanco County, Colorado. The discovery gas well was completed several weeks ago by Continental Oil Co., Union Oil Co. and Superior Oil Co. of California on a federal lease (permit) 20 years after the first application for a permit was filed. The unit agreement which eventually prevailed was issued to Mr. Hagood in January 1938 after he had "worried" it through two separate withdrawals. His rights as the unit operator were transferred to Superior in August 1941.

Mayben P. Newby, auditor of the Skelly Oil Co., has been elected president of the Kansas City control of the Controllers Institute of America.

Oliver March, controller of the Wheland Co., has been elected secretary-treasurer of the Chattanooga control of the Controllers Institute of America.

Hugh L. Patch, controller of the Standard Oil Co. (Ohio), has been elected a director of the Cleveland control of the Controllers Institute of America.

W. W. Bland, secretary-treasurer of the Gulf Coast Drilling & Production Co., has been elected president of the Houston control of the Controllers Institute of America. **Gay Carroll,** controller of the Humble Oil & Refining Co.; **J. H. Lollar, Jr.,** secretary-treasurer of the Republic Supply Co., and **S. G. Loy,** assistant controller of the Humble Pipe Line Co., were elected directors.

Baker Saulsbury has taken a position as land man in Texas for Kerlyn Oil Co., of Oklahoma City, Okla. He started on his new job July 1.

Jack Rover has been promoted to assistant master mechanic at the Standard Oil Co. (Ohio) Latonia refinery, Covington, Ky. He had served in the capacity of foreman for the past 9 years and was shift foreman immediately previous to his recent promotion. He joined Standard of Ohio's manufacturing staff 11 years ago as a chemist in the Latonia refinery's asphalt department.

E. R. Jukes, formerly an independent producer in Illinois and representative of Cardwell Manufacturing Co. in that state, is now in England serving as a lieutenant in the First Bombardier Wing of the Army Air Force.

Canadian Fields

(Continued from Page 73)

Dawson Creek, and between 2 and 3 miles inside Alberta.

Saskatchewan.—Oil showings have definitely been reported in wells drilling in several different Saskatchewan areas. South of Regina, Norcanols-Ogema 1, LSD 4, 24-7-28w2, is fishing at 7,688 ft. after drilling through two limestone formations with several distinct oil horizons. Imperial-Dahinda 1, LSD 10, 28-10-23w2, is below 5,208 ft. after encountering showings in the Madison. In the Kamsack shallow gas field, eastern Saskatchewan, Oil Ventures 7 drilling below the sand at 350 ft. encountered considerable traces of oil, and is deepening. In southwestern Saskatchewan, Twin Province 1, NE 21-11-29w3, drilled for Burke & Cobb of Montana by the Alberta Drilling & Development Co. of Calgary is below 3,625 ft. after getting the lime at 3,493 ft., with considerable shows of oil and gas close to the contact.

In western Saskatchewan, Vera Oilfields 3, LSD 11, 12-42-24w3, has derrick up and is waiting for rig. Location was picked by a seismograph survey under direction of Dr. F. F. Hintze of Salt Lake City, and is correlated with and about 4 miles northeast of three previous tests by the Vera company.

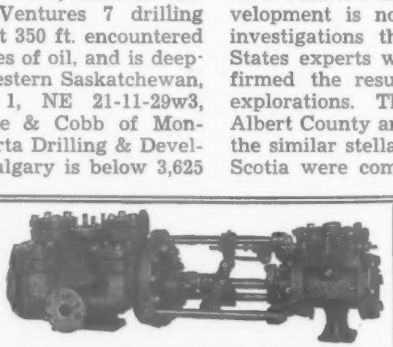
New Brunswick.—W. B. Timms, director of the mines and geology at Ottawa, reports that surveys of New Brunswick oil shales made last year have resulted in a decision that development is not warranted. In the investigations the advice of United States experts was secured, and confirmed the results of the Canadian explorations. The shale deposits of Albert County and adjacent areas and the similar stellarite deposits of Nova Scotia were commercially utilized in the last century, prior to the discovery of free petroleum by drilling: the shales being mined and exported to plants in the New England states for treatment, the main product being illuminating oil.

LEGAL

OIL AND GAS LEASE
UNITED STATES DEPARTMENT OF AGRICULTURE

Farm Security Administration, Little Rock, Arkansas, July 13, 1943. Sealed bids in triplicate will be received until 2 p.m., CWT, August 25, 1943, and then publicly opened, offering bonus for operating rights in connection with gas and oil leases on 869.70 acres of land described as follows: Section 94, Township 15 North, Range 13 East, containing 549.70 acres, more or less, and the N-½ of Section 23, Township 15 North, Range 14 East, containing 320 acres, more or less, Madison Parish, Louisiana, near Thomastown. Award of lease will be made only to bidder who can show sufficient experience and financial resources and prove citizenship. Interested parties may obtain bid documents, lease forms, and operating regulations from the office of the Regional Business Manager, Farm Security Administration, 310 Donaghey Trust Building, Little Rock, Arkansas.

McGowan
SIDE POT
CLOSE
CLEARANCE
Pumps
for the
PETROLEUM
INDUSTRY



6, 12, and 18 inch Strokes—Liquid, Steam Cylinder sizes to suit conditions—Designed Pressures in cast iron—400 p.s.i. suction, 600 p.s.i. discharge, 250 p.s.i. steam—Large Valve Areas—Trim to suit service conditions—Water jacketed stuffing boxes.

Also manufacturers of these type pumps:

Simplex and Duplex • Steam and Power Driven • Horizontal and Vertical • Forged Steel, Cast Steel, Bronze and Various Alloys • Valve Plate, Side Pot, and Miscellaneous Designs.

McGOWAN PUMPS

LEYMAN MANUFACTURING CORP.
The JOHN H. McGOWAN Co. DIVISION
59 CENTRAL AVE. CINCINNATI, OHIO

HOW TO BRING YOUR LIST OF REFINERY AND NATURAL-GASOLINE PLANT PERSONNEL UP-TO-DATE

The Oil and Gas Journal's new Survey of Refineries and Natural-Gasoline Plants—just off the press—will give you the names and addresses of hundreds of NEW executives (from presidents down to foremen) in this field. In addition there are complete lists (by states) of both the active and shut-down plants, showing their input and output capacities, type of products manufactured. It's a buy at

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Send your order and remittance to THE OIL AND GAS JOURNAL, Tulsa 1, Okla.

Market Developments

East Coast

NEW YORK.—Continuing improvement in the East Coast oil-supply situation is being met with renewed efforts for the elimination of the pleasure-driving ban. Agitation has been particularly strong in the southeastern states where an excess of gasoline is reported. Whether or not this excess would withstand the removal of the pleasure-driving ban is questionable, and for this reason removal of the ban is being delayed.

The A.P.I. index of available supplies rose again in the last week, making the fifth consecutive advance. The current rise has been almost as marked as the decline last winter and is much more rapid than the advance in the summer of 1942. However, the current advance began from a much lower level, the low point this year being 25.5 on May 8 in contrast to 49.2 on June 1, 1942, and accordingly has much further to go.

The last rise in the index was 2.5 points and as such was the largest of the year. Whether this rate will be accelerated or not will be known shortly when the WEP line, completed this week, goes into operation. This will be accompanied by a decline in tank-car shipments since they will be returned to Gulf-East Coast service, doubling the length of the haul from Norris City, Ill.

Maximum prices on bulk-lot sales of gasoline by tank-wagon sellers were reduced last week when the OPA established prices on quantities of 10,000 gal. or more at 0.5 to 0.75 cent under the full tank-wagon ceiling. Both refiners and resellers in the states of New Jersey, Pennsylvania, Delaware, Maryland, Virginia and the District of Columbia were affected by the ruling.

Mid-Continent

ABOLISHMENT of restrictions July 1 on the percentage of gasoline produced from crude processed in District 2 refineries has shown no tendency so far to ameliorate the critical supply situation. Increasing demands, chiefly from agricultural centers, are more than offsetting the rising current production. Refiners are declining to quote on new inquiries and in many cases are satisfying only part of previous commitments.

Numerous District 2 refineries are virtually confined to current production, having long since depleted their working reserves. Efforts to purchase in the open market generally are unsuccessful. Veteran refiners report that the existing motor-fuel market is without recent precedent in tightness of supplies.

Involuntary restrictions on gasoline consumption below levels permitted by OPA rationing program may develop in local areas, especially those which are dependent on tank-car shipments. Indications are that another reduction in the number of tank cars available for distribution of oil products in the Middle West will develop from current negotiations in Washington D. C., to equalize motor-fuel rations on nearly a national scale.

Meanwhile, markets for all products remained unchanged. Refiners are quoting and selling practically all products at ceiling prices and there are no factors now apparent to justify a recession.

Gulf Coast

HOUSTON, Tex.—No relief was in sight this week for a scarcity of refinery-oil products that Gulf Coast manufacturers declared was without precedent.

Stocks of all grades of gasoline in tanks of independent refiners of the Gulf Coast territory totaled 1,912,988 bbl. at latest report, a drop of 385,000 bbl. in 2 weeks. Men familiar with refinery statistics in this area declared they could recall no other such sharp decline. In the same length of time, gas-oil stocks of independent refiners fell from 551,978 to 538,410 bbl. Stocks of Bunker C fuel oil, already critically low, dwindled to 53,555 bbl. This is about one-tenth of normal inventories. Stocks of No. 5 fuel oil are virtually at zero. This material is made especially for the Navy, and it is taken as fast as it is produced.

Total stocks of all refined-oil products in tanks of Gulf Coast independents were 3,341,172 bbl., a recession in 2 weeks from the previous low of 3,953,516 bbl. On May 15, 1942, before war conditions had made their inroads, these stocks totaled 6,871,000 bbl., more than twice what they are today. Major refiners report conditions that parallel those among the independents.

Although still extremely tight, buyers said there were signs of slight easing in the kerosene market. "You can get an occasional car now," was one comment. Natural gasoline, demand for which has ascended swiftly in recent months, was one of the hardest products to find.

A.P.I. REFINERY REPORT

(Figures in thousands of barrels)

Week Ended July 10, 1943

	Dly. crude runs to stills	Stocks: Gasoline	Stocks: Residual	Stocks: Gas oil
Appalachian	147	2,171	548	1,039
Ind., Ill., Ky.	750	15,964	3,260	5,210
Okla., Kan., Mo.	345	6,217	1,633	1,952
Censored area*	1,878	31,439	13,135	14,462
Rockies	101	1,821	674	366
California	731	20,006	47,892	12,090
Total 7-10-43	3,952	77,618	67,142	35,119
Total 7- 3-43	3,905	78,316	66,470	34,380
Total 7-11-42	3,564	84,847	77,766	34,112

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of PAW.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
July 10, 1943	239,091,000
July 3, 1943	240,927,000
July 11, 1942	251,311,000

*Excludes unrefinable stocks in California.

Pacific Coast

LOS ANGELES, Calif.—There has been a slight strengthening in fuel-oil and gasoline prices in the spot market but for the most part gains have been only fractional. The improvement in gasoline quotations reflects attempts being made among independent refiners to eliminate rebranding practices. For the most part these practices involve distress gasoline or at least a motor fuel inferior to the grade being sold under the refiner's trade name, although in some cases it is a good grade gasoline that must be moved to make room for future accumulations. Large-volume sales are usually in the latter classification and where a station can take 20,000 to 40,000 gal. the operator can usually get a better price and a better product.

There is a tendency among refiners able to do so to accumulate gasoline stocks as well as gas-oil stocks. Every indication is that gas-oil prices will sooner or later show an increase in prices as this is a prime blending agent with heavy fuel oil.

For the past few months fuel oil in the spot market has not commanded top prices as the larger companies would rather produce their own heavy crude oil to meet fuel-oil demand than to go out into the open market and bid for fuel oil. Consequently fuel oil has not been moving in any great volume and what has moved has been at prices substantially below the pegged price.

Refinery Prices

(Prices as of July 20)

Quotations are f.o.b plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

REFINERY GASOLINE

Octane (A.S.T.M.):	†80	74-76	72-74	68-70	63-66
Mid-Continent*	.....	.....	5.875-6.000	.....	5.500-5.625
Pennsylvania	.....	6.750-7.000	.....	.....	.....
Gulf Coast	6.00-6.50	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750
Northeast Coast	9.80	.....	9.2	9.2	.....
California	.....	6.125-6.500	6.000-6.125	5.500-6.000	5.000-5.250

*Basis Group 3. †1939 C.F.R. (research method). ‡Unleaded.

KEROSENE AND NO. 1 FUEL OIL

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	4.125	.....

*Basis Oklahoma Group 3.

TRACTOR, DIESEL, AND BUNKER FUEL OIL

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Residual Bunker C§
Mid-Continent*	4.125	.....	.....	.....	.....	$0.80-1.27
California	.....	2.750-4.000	.....	.....	‡1.35-1.45	0.85-1.00
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85-1.27
Northeast Coast	.....	.....	.....	6.800	2.780	1.65-2.07
North Louisiana	.....	.....	.....	.....	.....	0.80-1.27

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200. §Gravity range.

FURNACE OIL, GAS OIL, FUEL OIL

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
California	5.5	5.5	‡1.10-1.25	§1.10-1.15
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3 †36-40 gravity fuel. ‡Pacific Specification 300. §Pacific Specification 400.

NATURAL GASOLINE

Grades:	26-70	18-55
Oklahoma (Group 3)	3.875	4.650
North Texas	3.500	4.200
North Louisiana	3.625	4.350
California	4.875	5.500

LUBRICATING OILS

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 16-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash)		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oils

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		37.50
10 pour point		36.50
15 pour point		35.50
25 pour point		30.00
200 vis. at 70° F., 3 color:		
Zero pour point		39.50
10 pour point		38.50
15 pour point		37.50
25 pour point		32.00

WAX

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND
(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.95	5.50	10.50
Boston, Mass.	14.90	4.50	10.10
Burlington, Vt.	16.90	5.50	10.20
Buffalo, N. Y.	16.20	5.50	10.90
Dover, Del.	16.70	5.50	12.30
Hartford, Conn.	15.60	4.50	10.00
Manchester, N. H.	17.30	5.50	12.10
Newark, N. J.	15.20	4.50	10.00
New York, N. Y.	16.10	5.50	10.10
Philadelphia, Pa.	16.20	5.50	11.95
Pittsburgh, Pa.	16.70	5.50	12.30
Portland, Me.	16.30	5.50	10.20
Providence, R. I.	15.00	4.50	9.90
Washington, D. C.	15.20	4.50	11.30
Average 14 cities	16.02	5.14	10.85

(All prices undivided dealer basis.)

CENTRAL
(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN
(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	18.90	7.50	*11.50
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.95	7.50	....
Charleston, W. Va.	19.25	6.50	13.30
Charlotte, N. C.	20.10	7.50	11.30
Jacksonville, Fla.	18.90	8.50	9.50
Jackson, Miss.	17.50	7.50	†9.00
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	17.90	8.50	10.50
New Orleans, La.	17.75	8.50	*10.00
Norfolk, Va.	17.45	6.50	12.30
Average 11 cities	18.34	7.56	10.49

*Includes 1-cent state tax.
†Includes ½-cent state tax.

MIDWESTERN
(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

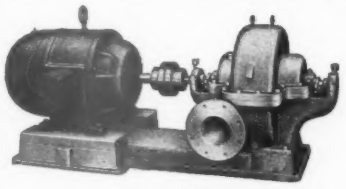
PACIFIC COAST
(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.80
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.80
Average 3 cities	16.17	5.83	13.03
Average 50 cities	16.55	5.98	10.87

Equipment Progress

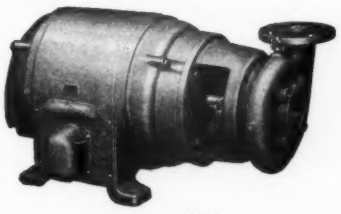
Aurora Announces New Pump Designs

Aurora Pump Co., Aurora, Ill., announce an improved line of Type AD Aurora two-stage, horizontally split case centrifugal pumps in capacities up to 600 g.p.m. and heads to 400 ft. These pumps are a refinement of the former Aurora Type AMB pumps and are distinguished for their streamlined water passages and impellers, both hydraulically coordinated to minimize flow resistance. The new AD pumps are compact and are readily accessible due to the removability of the upper half of the pump casing without disturbing the suction or discharge connections.



Type AD

The company also announces a new line of Type GMC close coupled centrifugal pumps designed for many services, notably marine duties, where compactness is at a premium. The impellers and shells are scientifically streamlined in the interest of high efficiency and smooth, quiet performance. The Aurora GMC design of close motor-pump mounting is simple, strong, and neat in appearance. The pumps are available in a capacity range of from 5 to 1,000 g.p.m. for operation against heads up to 100 lb. per sq. in.



Type GMC

MALONEY TANK COMPANY DOUBLES PLANT SIZE

Maloney Tank Manufacturing Co., Tulsa, for three decades makers of the bolted steel tank which it originated and patented, recently doubled the size of its plant in order to serve their customers with both bolted and welded tanks, separators, and pressure vessels, according to O. W. Maloney, president.

The firm recently received an entire train load of steel sheet, consisting of 40 cars. It is increasing production of pressure vessels, separators, bolted and welded tanks, and special order fabrications.

A welding plant was recently added to the company and new tools, machinery, lathes, and equipment have been installed. A power roll, largest in Tulsa, has also been purchased by the company. It rolls up to 1¾-in. plates, according to the company.

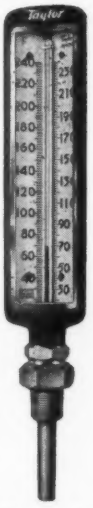
A part of the Maloney Manufacturing Co.'s expansion is this No. 2 Plant which will be used primarily for producing welded steel tanks and pressure vessels. Characteristics of Maloney's wartime work are the flag and bolted tank in the foreground. To the right is part of the 40-car train load of steel, largest shipment ever made at one time to a Tulsa manufacturer

Taylor Foundry Offers Unusual Service

Taylor Foundry Co., Wichita Falls, Tex., offers a unique service on replacement pistons, in the rough, for 73 different makes of oil, gas or steam engines, pumps and compressors. A complete line of different types for each make is offered, varying in horsepower and bore. A catalog on "Tayfyco" replacement pistons will be sent on request.

Announces New Industrial Thermometer Design

Taylor Instrument Cos., Rochester, N. Y., have designed, tested in the field, and are now intrducing a one-piece industrial thermometer.



The one-piece case is shallower which makes it possible to see the mercury column through a wider angle of vision. The chromium-plated bezel fits snugly into the grooved case in such a way as to hold the thick glass front securely against four wavy tension springs. These springs are fastened securely under the scale by shakeproof screws. This construction results in a dustproof, rattleproof, and practically fumeproof thermometer. It can withstand vibration and severe shocks.

The new instruments will be equipped with easy-reading Binoc tubing. They will be furnished in many combinations of straight and angle stems, with threaded or union connections, and in many standard temperature ranges, within the limits of —40° F. to +750° F.

Sump-Type Liquid Filter

An entirely new radial fin sump-type liquid filter has been designed by Staynew Filter Corp., Rochester, N. Y. It is intended for use wherever dirty liquids are collected, filtered and recirculated. The filter can be mounted on the end of pump suction lines and completely submerged in the settling basin or sump from which the pump obtains its liquid. The installation protects the pump from abrasive particles which cause rapid wear, and at the same time provides clean liquid at various points of usage. The filter has four major parts: An upper end plate mounting a threaded sleeve outlet connection and a perforated metal central supporting tube on which is mounted the filter insert; a heavy corrugated metal

screen to supply strength and rigidity, over which slides the preformed filter insert, a lower end plate. A wing nut holds the entire assembly together.

First National Bank of Tulsa Promotion Wins Awards

The Stanley J. Ehlinger Advertising Agency of Tulsa introduced at the 1943 annual convention of the National Advertising Agency Network, held at the Park Central Hotel, New York City, samples of recent outdoor and war bond promotion of the First National Bank & Trust Co., of Tulsa. They were awarded first place for the best outdoor advertising and third place for the best war bond promotion.

These awards were based on the exhibits prepared by the 27 advertising agencies who comprise the N.A.A.N. These members placed during the past year, over 8,000 pages of business paper space for their 738 clients, in diversified industries from coast to coast.

Trade Literature

Davey Compressor Co., Kent, Ohio.—Operator's Instruction Manual covering the operation, care and maintenance of Davey compressor units. The manual also covers details on the Davey split propeller heavy-duty truck power takeoff and a supplement on the operation and maintenance of pneumatic tools. The manual is designated as Form E-144.

Air Reduction Co., 60 East Forty-second Street, New York.—A new 12-page booklet, "Pipe Templates for Welded Fittings," which tells how to fabricate fittings for welded piping installations by means of flame cutting and welding. It shows how to draw up and use paper templates for flame-cutting pipe to assure accurate, close-fitting connections.

Walter Kidde & Co., 140 Cedar Street, New York 6.—An illustrated 16-page manual entitled "How to Teach Fire Fighting," which is designed to aid factory executives in instructing employes in fire-extinguishing techniques. It describes the various types of fires, the kind of extinguisher best suited to each and the methods of setting up demonstrations.

McDonald Co., 1248-F South Hope Street, Los Angeles 15, Calif.—New safety catalog and manual which covers the entire field of products designed to reduce industrial hazards. It is divided into sections for easy reference and for convenience and economy in permitting the release of only those sections likely to be of interest to the safety engineer.

Among Equipment Men

Youngstown Sheet & Tube Promotes Three

J. L. (Pete) Mauthe has been appointed vice president in charge of operations of Youngstown Sheet & Tube Co., Youngstown, Ohio, to succeed the late William B. Gillies. In his new position Mr. Mauthe will have charge of operations of the company's Youngstown and Chicago district manufacturing properties as well as supervising all its mining properties. His promotion came after 31 years in the iron and steel industry, eight of those years with his present company.

J. L. MAUTHE

B. M. STUBBLEFIELD

Albert S. Glossbrenner has been named to succeed Mr. Mauthe as general superintendent of the Youngstown district. Prior to his recent promotion he was superintendent of the company's Brier Hill plant, where he in turn has been succeeded by Buford M. Stubblefield. Mr. Glossbrenner went to Youngstown 8 years ago as assistant superintendent of the hot strip mill, becoming superintendent about 3 years later. He was appointed as superintendent of the Brier Hill plant last September.

Mr. Stubblefield began his service with the company in 1916 at the Campbell Works coke plant. After 4 years he was made assistant superintendent, and in 1923 was made superintendent. In 1929 he was made superintendent of the coke plant and blast furnaces at Campbell Works.

Wile Joins Engineering Staff of Carrier Corp

D. D. Wile has joined the engineering staff of Carrier Corp., Syracuse, N. Y., according to an announcement by H. L. Laube, vice president, head of the engineering division.

Mr. Wile has a broad background in the fields of engineering and manufacturing. After completing his engineering courses at University of Kentucky, he joined American Radiator Co. as research engineer. After several years he went with Detroit Lubricator Co. where he held the position of chief engineer of the refrigeration and air-conditioning division. From 1937 until 1941 he was chief engineer of the refrigeration division of Savage Arms Co. For the past 2 years he has been general plant manager of the Kellogg division of American Brake Shoe & Foundry Co.

Greenman Joins Ludlow

P. R. Greenman has joined Ludlow Valve Manufacturing Co. as industrial sales engineer in the Chicago territory. Mr. Greenman is a mechanical engineer and designer of wide experience in power-plant equipment, oil-refinery and coal-handling equipment. His early work, following graduation from University of Illinois, was as designer of valves, tools, fittings and special machinery for Detroit Lubricator Co. and the American Valve Co. Later connections were with the Wright-Martin Aircraft Co. as tool development engineer; as plant engineer with Power Specialty Co. of Danville, N. Y.; and from 1922 to 1934 as resident engineer with Foster Wheeler in Chicago. In January 1935 Mr. Greenman joined Favelle-LeVally Corp. as resident engineer in Chicago, returning in 1937 to Foster Wheeler as Cincinnati district manager.

Bergeron California Sales Manager for Baash-Ross

F. E. BERGERON

Frank E. Bergeron has been appointed California sales manager for Baash-Ross Tool Co., Los Angeles, Calif., succeeding B. Bronzan, who is now devoting his full time to general managership of the organization. Mr. Bergeron, by reason of his widespread knowledge of the industry, is well qualified for his new post. After graduating from U.C.L.A. he accumulated 3 years mining experience before coming with the Baash-Ross organization in 1935. After several years in the shop, gaining experience in the design and operation of the Baash-Ross products, he went into sales office work, followed by a 4-year period as field sales representative.

Classified Advertising

EQUIPMENT FOR SALE

FOR SALE: 2—110 HP Miller Compressors, horizontal type, gas prime mover, 80# intake, 365# discharge, 180 RPM. BANKOFF SUPPLY CO., Box 2301, Tulsa, (1), Okla.

FOR SALE: Four 10 x 4½ x 10 Duplex Steam Pumps, make Worthington and Gardner-Denver. Good condition. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE: One 7" RB Union Tool Draw Works unitized; one Johnson Jack Shaft type Draw Works unitized. Both in A-1 condition. Inquire T. T. Eason and Company, Enid, Okla.

HOUSTON MACHINE SHOP FOR SALE
$20,000.00
Very profitable jobbing business; wonderful post-war possibilities. For sale account owner's health. Address—P.O. Box 1122, Houston, Texas.

TWO-STAGE Ingersoll-Rand Compressor with 30 HP Foos Balanced-crank Engine and Magneto, all for $750. E. Cline, 531 Third St., Marietta, Ohio.

FOR SALE at Bartlesville—1—9' x 26' Gasoline Storage Tank ¼" Plate. Cities Service Oil Co., Patridge, Bartlesville, Okla.

1—500 HP Terry condensing turbine—1750 RPM.
1—700 HP Terry condensing turbine—2900 RPM.
1—100 HP Superior twin gas engine compressor.
1—I. Rand 14/7 x 14 Type XRB compressor with 150 HP motor, all on steel skids.
2—I. Rand type XPVR 1800 ft. compressors—steam driven.
4—4" Pacific 10 stage centrifugals—500 GPM-750#.
1—600" x 34' Southwestern flash column.
1—750 sq. ft. Southwestern condenser, steel shell, admiralty tubes.
1—670 sq. ft. Braun 6 pass, 250# atmospheric section.
1—40 sq. ft. G. Rusell shell and tube condenser, 800# WP.
2—14 x 12 I.R. cylinders XRB.
2—14 x 14 I.R. cylinders XRB.
DAVE WEST COMPANY
2301 East 37th St., Los Angeles, Calif.

1—10,000 gal. Tank Car Tank.
1 Steel multiple 3 Tank support for 10'6 x 18' Tanks.
Gate valves—Tokheim Valves.
Write
THE W. H. DYER COMPANY
Fullerton Bldg. (1), St. Louis, Mo.

WELDING RODS
Good supply mild steel, reverse or straight polarity and AC, available immediate delivery. Excellent deliveries on stainless steel electrodes and 4-6% Chrome and Alloy Electrodes.

WELDING MACHINES
New; Used. Gasoline Operated and Electric Driven DC Machines and AC Transformers Types. PETROLEUM EQUIPMENT SALES CO., 910 Clay Ave., Houston (1), Texas.

FOR SALE in Oklahoma, two steel stacks 6' x 72' and 5' x 90'. Cities Service Oil Co., Patridge, Bartlesville, Okla.

3 ROTARY PUMPS
2—90 GPM Viking 3 HP, 3 Ph. 60 Cy. 220 V. Single Pumps.
100 GPM Blackmer 3 HP, 3 Ph. 60 Cy. 220 V. Double Pump.
PUMPS BOUGHT AND SOLD
L. M. STANHOPE
Wayne, Penna.

DIESEL ENGINES
Large selection — All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—also boilers, steam engines, turbo generators.
Complete Information on Request
A. G. SCHOONMAKER COMPANY
45 Church Street New York, N. Y.
Phone—WOrth 2-0455

EQUIPMENT FOR SALE

TANK TABLES — TANK STRAPPING
Prompt Service
T. A. CONNEELY
Tank Gauging Engineer
BRADFORD, PA.

EQUIPMENT WANTED

WANTED
Used storage tanks:
Pressure Tanks:
All sizes
Send us your list.
SONKEN-GALAMBA CORP.
108 N. 2nd St., Kansas City, Kansas

WANTED: Two welded drum, 30" to 36" diameter by 12' to 15' long by 1" to 1¼" thick; 1 Drum 24" x 32' x ⅝" to ¾" Shell; and 5 Close clearance Hi-Vol Union (or equal) pumps as follows: 2—6½" x 3" x 8"; 2—6" x 5" x 12"; 1—14" x 3" x 14". Box B-687, The Oil and Gas Journal, Tulsa, Okla.

WANTED
Rotary Drilling Outfits
If you have any rigs for sale, please forward complete information.
LUCEY PRODUCTS CORPORATION
Tulsa, Okla.

WANTED: Risse drilling engine in good condition, 140 or 170 HP preferred. Write Box 1312, Cut Bank, Montana.

WANTED: 2800 to 3000 gallon oil field type Butane tank in good condition, located in Kansas or Oklahoma. Beardmore Drilling Company, Wichita (2), Kansas.

WANTED
Used Structural Steel
Pipe — Valves
Fittings
Send us your list
SONKEN-GALAMBA CORP.
108 N. 2nd St., Kansas City, Kansas

LEASES AND DRILLING BLOCKS

NEW MEXICO
State Oil and Gas Leases
Forty acres and multiples thereof, in a new HoT spot, 23 oil companies own surrounding leases. Write for information. No obligation. HARRY S. WRIGHT, New Mexico State Lessee, Farmington, N. M.

5 OR 10 YEAR OIL AND GAS LEASES, TEXAS
2,000 acres S. E. Ward County.
3,000 acres Upton Co., near Crane.
1,292 Loving Co., near Winkler Co.
1,600 Terry Co., near Yoakum & Gains Cos.
1,520 Bowie Co., adj. Morris & Marion Cos.
134 Cass Co., 5½ mi. W. Linden in assembled block.
173 Rains Co., adjs. Van Zandt Co.
640 Webb Co., near Mirando.
MRS. WILLIE R. TIMMINS, OWNER FEE
4309 Stanhope Ave., Dallas, Texas, J8-7360

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois.
20 Years' Experience
Inquiries Invited.
B. D. BUCKLEY
60 Broadview Drive, Clayton
St. Louis, Mo.

LEASES AND DRILLING BLOCKS

NEW 89-acre lease, ¾ mile from production, Shelby County, Texas, two other wells to start soon. $3.50 per acre. Excellent buy! Four Thousand acre drilling block on good structure. Write C. A. Parker, Box 451, Center, Texas, for information.

FINANCING

CAPITAL SEEKERS—Interested in raising $25,000 or more for a legitimate project should write to AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

Crude-Oil Prices

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Texas*
18-18.9	$0.80	....	....	....
19-19.9	.84	....	$1.06	$0.70
20-20.9	.86	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, District Land Office, Billings, Montana. Notice is hereby given that the lands herein described within the known geologic structure of the Elk Basin field, Montana and Wyoming, are offered to qualified bidders of the highest amounts offered per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act, as amended by the act of August 21, 1935 (49 Stat. 674, 30 U. S. C. 226), at a sale to be held in the district land office at Billings, Montana, at 10 o'clock a.m. August 12, 1943, in the following parcels: Montana, M.M., Parcel No. 1, T. 9 S., R. 23 E., sec. 34, lot 8, sec. 36, lot 5. Wyoming, 6th P.M., Parcel No. 2, T. 58 N., R. 99 W., sec. 19, N½NW¼NW¼SE¼, E½NW¼SE¼, E½SW¼SE¼; Parcel No. 3, T. 58 N., R. 99 W., sec. 30, E½NE¼NW¼NE¼, NE¼SE¼NW¼NE¼, NW¼NE¼NE¼, W½SW¼NE¼NE¼, NE¼SW¼NE¼NE¼, E½E½NE¼, SE¼NW¼SE¼NE¼, SW¼SE¼NE¼, NW¼NE¼SE¼, E½E½SE¼, SW¼SE¼SE¼; Parcel No. 5, T. 58 N., R. 100 W., sec. 25, NE¼NW¼, W½SW¼NE¼SE¼, W½SE¼SE¼, S½NE¼SE¼SE¼, SE¼SE¼SE¼. Each successful bidder must deposit on the date of sale with the officer in charge of the sale a certified check on a solvent bank or cash for one-fifth of the amount bid by him and file the showing of qualifications to receive a lease required by section 7 of Circular 1386. The remainder of the bonus bid and the annual rental at the rate of $1 per acre must be paid and a $5,000 corporate surety bond must be furnished prior to the issuance of the lease. Bids may be submitted combining two or more parcels for the lands in Wyoming provided the aggregate acreage does not exceed 640 acres, the drilling, producing, rental and royalty requirements to apply separately to each parcel. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Register.

Journalisms:

IN no oil-field activity is prevention preferable to cure more than in water encroachment. The causes of water coning in producing wells have been discussed in the past but are often largely forgotten today with the result that a steadily increasing number of wells are having to handle large volumes of water. In next week's Engineering and Operating Section, Vic E. Baum, consulting oil-well completion engineer, will review the subject of water coning and will outline a method for overcoming water encroachment.

HOW a record run of more than 6 months was established in a coil and fired-soaker reforming unit in an eastern refinery is the subject of a staff article which will appear in next week's Journal. The record continuous run was partially due to innovations and modifications of customary procedure.

MANY areas have had a remarkable industrial development based on natural gas and this fuel is also widely used in many cities. Owing to increasing war demands and to a falling off of production in the older fields, these areas are facing a fuel shortage and some of them are having to convert to manufactured gas or other fuels. In refining centers there is a surplus of gas produced in the refining process. A plant has been constructed in southwestern Ontario which takes refinery gas and adds it to the dwindling supply from local fields, making a mixture which is satisfactory as fuel. The plant and the blending methods used will be discussed in an early issue of the Journal.

IN next week's semiannual review at least one trend is brought to light which warrants considerable study on the part of all who are interested in the industry's future. There are about 80 fields whose combined production is a little over half of the nation's total. Most of these fields are old but they constitute the principal reserve of oil, possibly 70 per cent of the nation's total. This year there has been a large increase in production from such of these fields as are capable of yielding more oil. One year ago two fields less than 1 year old had zoomed beyond the 10,000-bbl.-a-day mark and two others were only slightly more than 12 months old. This year, there are no such fields.

THE discovery record of the first half of 1943, as disclosed in next week's issue, is better than that of 1942 only if extensions and deeper pays in old fields are considered as discoveries. East Texas, Michigan, and Illinois have the best record for new fields although those in Illinois are small and those in Michigan are being produced rapidly. In the past the Gulf Coast has been one of the nation's best areas for exploration. How many fields discovered in this area during the past year now have an average daily production of more than 200 bbl.? The answer, which may surprise most readers, is three, from the Mississippi to the Rio Grande. There were two such fields in Kansas and none in Oklahoma.

THE distribution of wells completed during the first half of 1943 also presents some interesting angles. Nearly 20 per cent of all completions were in the eastern area. Texas and Louisiana show big declines. California has had a large increase but this is confined almost entirely to the old heavy-oil fields.

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CALENDAR

July

KENTUCKY OIL AND GAS ASSOCIATION, annual midyear meeting, Ashland, Ky., July 24.

September

AMERICAN CHEMICAL SOCIETY, petroleum division, fall meeting, September 6-10. Place not yet determined.

October

AMERICAN ASSOCIATION OF OILWELL DRILLING CONTRACTORS, third annual meeting, Houston, Tex., October 5-6.

AMERICAN GAS ASSOCIATION, twenty-fifth annual meeting, Jefferson Hotel, St. Louis, Mo., October 11-13.

MID-CONTINENT OIL AND GAS ASSOCIATION, annual meeting, Blackstone Hotel, Fort Worth, Tex., October 14-15.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, annual meeting, Fort Worth, Tex., October 25-27.

November

AMERICAN PETROLEUM INSTITUTE, twenty-fourth annual meeting, Palmer House, Chicago, Ill., November 8-11.